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UNITED STATES PATENT AND TRADEMARK OFFICE

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DEPARTMENT
OF COMMERCE

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The following are mailed under direction of the Superintendent of Documents, Government Printing Office, Washington, D.C., 20402, to whom all subscriptions should be made payable and all communications addressed:

THE OFFICIAL GAZETTE (PATENT SECTION), issued weekly.

THE OFFICIAL GAZETTE (TRADEMARK SECTION), issued weekly.

GENERAL INFORMATION concerning PATENTS.

GENERAL INFORMATION concerning TRADEMARKS.

PRINTED COPIES OF PATENTS are furnished by the Patent and Trademark Office at $1.00 each; PLANT PATENTS in color, $8.00 each; copies of TRADEMARKS at $1.00 each. Address orders to the Commissioner of Patents and Trademarks, Washington, D.C., 20231.

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PATENT AND TRADEMARK OFFICE NOTICES

Patent Cooperation Treaty Information

For information concerning the PCT member countries see the notice appearing in the *Official Gazette* at 1037 O.G. 12 on Dec. 13, 1983. For use of the European Patent Office as a Searching Authority for PCT applications filed in the United States Receiving Office, see the notice appearing in the *Official Gazette* at 1022 O.G. 52 on Sept. 28, 1982.

Domestic PCT fees were increased on Oct. 1, 1982 by a rule change to 37 CFR 1.445 that was published at 1021 O.G. 11 on Aug. 10, 1982. The search fee for the European Patent Office was changed as of Jan. 22, 1983 and was announced at 1025 O.G. 27 on Dec. 28, 1982. International PCT fees were changed by the PCT Assembly effective Jan. 1, 1984 and were announced at 1037 O.G. 12 on Dec. 13, 1983. The current schedule of PCT fees is as follows:

Transmittal fee	$ 125.00
Search fee	
U.S. Patent and Trademark Office as Searching Authority	
· No corresponding prior U.S. national application filed	500.00
· Corresponding prior U.S. national application filed	250.00
European Patent Office as Searching Authority	
· All cases	670.00
International Fees	
Basic Fees (first 30 pages)	295.00
Basic Supplemental Fee (for each page over 30)	6.00
Designation fee (for each national or regional office)	70.00

GERALD J. MOSSINGHOFF,
Nov. 14, 1983. *Commissioner of Patents and Trademarks.*

REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.21(b)).

4,171,385, Re. S.N. 557,700, Filed Dec. 2, 1983, Cl. 426/658, ANIMAL FEED BLOCK CONTAINING MAGNESIUM OXIDE, Leroy V. Skoch, et al., Owner of Record: *Ralston Purina Co., St. Louis, Mo.,* Attorney or Agent: Virgil B. Hill, Ex. Gp.: 172

4,303,936, Re. S.N. 557,522, Filed Dec. 1, 1983, Cl. 358/77, STRUCTURE FOR AND METHOD OF REPRODUCTION, Daniel L. Shaw, Owner of Record: *Inventor,* Attorney or Agent: Dale R. Small, Ex. Gp.: 231

4,374,224, Re. S.N. 547,887, Filed Nov. 2, 1983, Cl. 524/298, TREE-RESISTANT ETHYLENE POLYMER COMPOSITIONS, John Knox Beasley, et al., Owner of Record: *E. I. Du Pont de Nemours and Co., Wilmington, Del.,* Attorney or Agent: Paul R. Steyermark, Ex. Gp.: 144

REQUESTS FOR REEXAMINATION FILED

Notice under 37 CFR 1.11(c). The requests for reexamination listed below are open to inspection by the general public in the indicated Examining Groups. Copies of the requests and related papers may be obtained by paying the fee therefor established in the Rules (37 [CFR 1.21(b)).

In the event correspondence to the patent owner is not received, this notice will be considered to be constructive notice to the patent owner and reexamination will proceed (37 CFR 1.248(a)(5) and 1.525(b)).

4,009,735, Reexam. No. 90/000,480, Requested: Dec. 14, 1983, Cl. 138/147, THERMAL INSULATION, Gordon P. Pinsky, Owner of Record: *Owens-Corning Fiberglas Corp., Toledo, Ohio,* Attorney or Agent: Paul J. Rose, Ex. Gp.: 240, Requester: Owner

4,164,714, Reexam. No. 90/000,476, Requested: Dec. 5, 1983, Cl. 330/10, POLYPHASE PDM AMPLIFIER, Hilmer I. Swanson, Owner of Record: *Harris Corp., Melbourne, Fla.,* Attorney or Agent: Yount & Tarolli, Ex. Gp.: 250, Requester: Owner

4,189,834, Reexam. No. 90/000,478, Requested: Dec. 9, 1983, Cl. 433/225, DENTAL REINFORCING PINS, Andrew J. Smith, Owner of Record: *Fairfax Dental, Ltd., Dublin, Ireland,* Attorney or Agent: Beveridge, DeGrandi & Kline, Ex. Gp.: 330, Requester: Ernest I. Gifford, Birmingham, Mich.

4,224,768, Reexam. No. 90/000,475, Requested: Dec. 5, 1983, Cl. 156/293, METHOD OF MANUFACTURING A GRATING CONSTRUCTED OF RESIN BONDED FIBERS, Joseph W. Wiechowski, et al., Owner of Record: *Poly-Trusions, Inc., Santa Ana, Calif.,* Attorney or Agent: Grant L. Hubbard, Ex. Gp.: 160, Requester: Harsco Corp., Camp Hill, Pa.

4,289,563, Reexam. No. 90/000,479, Requested: Dec. 13, 1983, Cl. 156/423, GRATING CONSTRUCTION AND ASSEMBLY METHOD AND APPARATUS, Joseph W. Wiechowski, et al., Owner of Record: *Poly-Trusions, Inc., Santa Ana, Calif.,* Attorney or Agent: Grant L. Hubbard, Ex. Gp.: 160, Requester: Harsco Corp., Camp Hill, Pa.

4,289,903, Reexam. No. 90/000,474, Requested: Nov. 30, 1983, Cl. 564/20, PARA-PHENYLALKOXY PHENYLUREA AND THIOUREA COMPOUNDS AND HERBICIDAL USE THEREOF, David M. Spatz, et al., Owner of Record: *American Cynamid Co., Stamford, Conn.,* Attorney or Agent: Alphonse R. Noe, Ex. Gp.: 120, Requester: Birch, Stewart, et al., Falls Church, Va.

4,301,206, Reexam. No. 90/000,473, Requested: Nov. 25, 1983, Cl. 428/193, SURGICAL WRAPPER, John S. Mills, Owner of Record: *Medline Industries, Inc., Northbrook, Ill.,* Attorney or Agent: James T. Fitzgibbon, Ex. Gp.: 160, Requester: United Cotton Goods Co., Inc., Griffen, Ga.

4,375,255, Reexam. No. 90/000,477, Requested: Dec. 6, 1983, Cl. 194/1, COIN HANDLING APPARATUS FOR A VENDING MACHINE, Glenn M. Roberts, Owner of Record: *Glenn M. Roberts, Madrid Cypress, Calif.,* Attorney or Agent: Francis A. Utecht, Ex. Gp.: 310, Requester: W. G. McLellan, Shipman Mftg. Co., Inc., Los Angeles, Calif.

National Inventors Day

The Patent and Trademark Office, the National Council of Patent Law Associations and the National Inventors Hall of Fame Foundation, Inc. will sponsor National Inventors Day in the Public Search Room on Saturday, Feb. 11, 1984 from 1:00 p.m. to 5:00 p.m. and

Sunday, Feb. 12, 1984 from 10:00 a.m. to 5:00 p.m. The public is invited to view the exhibits on these days. Inventors will be inducted into the National Inventors Hall of Fame on Sunday, Feb. 12, at 2:00 p.m.

In order to assemble exhibits it will be necessary to close the Search Room on Friday, Feb. 10, 1984 at 5:00 p.m. The removal of all personal property from the Search Room would be appreciated.

GERALD J. MOSSINGHOFF,
Dec. 27, 1983. *Commissioner of Patents, and Trademarks.*

DEPARTMENT OF COMMERCE
Patent and Trademark Office
37 CFR Part 1
[Docket No. 31-201-229]
Revision of Patent Practice

Agency: Patent and Trademark Office, Commerce

Action: Final Rule.

Summary: The Patent and Trademark Office is amending the rules of practice in patent cases, Part 1 of 37 CFR, to clarify the practice under certain sections of Public Law 97-247 of 1982 and to make certain other changes and clarifications in practice which have been found desirable after some experience. The rulemaking changes the practice under §§1.27 and 1.28 with regard to subsequently establishing small entity status and qualifying for a refund of fees paid in full. The changes in other rules clarify and improve the practice in certain areas.

Effective Date: Apr. 1, 1984

For Further Information Contact: R. Franklin Burnett by telephone at (703) 557-3054 or by mail marked to his attention and addressed to the Commissioner of Patents and Trademarks, Washington, D.C. 20231.

Supplementary Information: This rule change is designed primarily to 1) clarify the small entity status of independent inventors, small business concerns and nonprofit organizations having funding agreements with a federal governmental agency as defined in 35 U.S.C. 202(c) (4); 2) rewrite §1.28 to provide a system for obtaining a refund of a portion of a fee paid in full when small entity status is established within two months of the date of such payment; 3) provide that a separate statement establishing small entity status is not required in an application filed under §1.62 when such status has been established in the parent application; and 4) modify certain other rules to clarify practice.

New §1.21(1) establishes a fee for processing and retaining any application which is abandoned for failing to complete the application pursuant to §1.53(d). This new paragraph, as well as the changes to §§1.53 and 1.78, indicate that in order to obtain benefit of a prior U.S. application, either the basic filing fee or the processing and retention fee of §1.21(1) must be paid. Section 1.53(d) further establishes that the application will be disposed of if the required fee is not paid within a set period. Section 1.56(b) requires submission of copies of foreign patent documents, non-patent publications, or other non-patent items of information disclosed pursuant to the duty to disclose. New §1.191(d) clarifies that §1.136 applies in patent applications and that §1.550(c) applies in reexamination proceedings to all time periods set forth in §§1.191-1.194, 1.196 and 1.197.

Discussion of Specific Rules and Significant Differences Between Proposed and Final Rules: Section 1.5, paragraph (a) is amended to remove a reference to §1.55, which is no longer appropriate and to clarify how letters to the Office are to be identified.

Section 1.6 is amended as proposed to clarify the manner in which letters and papers, including fees, filed in accordance with §1.10 by "Express Mail" are date stamped when received in the Patent and Trademark Office. Such letters and papers, which comply with §1.10, will be stamped with the date of deposit as "Express Mail" with the United States Postal Service unless the date of deposit is a Saturday, Sunday or federal holiday within the District of Columbia, in which case the date stamped will be the next succeeding day which is not a Saturday, Sunday, or a federal holiday within the District of Columbia. No papers are received in the Patent and Trademark Office on Saturdays, Sundays, or federal holidays within the District of Columbia.

Section 1.10, paragraphs (a) and (c), are amended to clarify that papers deposited as "Express Mail" on a Saturday, Sunday, or a federal holiday within the District of Columbia will be stamped with the date of the next succeeding day which is not a Saturday, Sunday, or a federal holiday within the District of Columbia. A cross reference to §1.6(a) has also been added to the rule. This change was not contained in the notice of proposed rulemaking but is being made to avoid confusion and to ensure that the Office's practice in date-stamping of papers is clearly understood. The change was suggested by a comment received on the proposed rules.

Section 1.14 is amended as proposed to revise paragraph (b) to clarify that only complete patent applications as defined in §1.51(a) which become abandoned will be retained for a period of twenty years from the filing date. Incomplete applications will be retained as provided in §§1.21 and 1.53.

Section 1.19, paragraph (b)(3), is amended as proposed to clarify that only copies made from Office records, but not prepared by the Office, will be compared with the original prior to certification of the copies. The Office will not compare copies made from some other copy or record with Office records for purposes of certification. The stated charge of ten cents per page would not be sufficient to make a word-by-word comparison. The requirements of the public appear to still be served by limiting the use of the comparison fee to Office records.

Section 1.21 is amended as proposed to revise paragraph (b) (2) and establish a new paragraph (1). The change in paragraph (b) (2) is in accord with the change in §1.25 (a). New paragraph (1) provides a fee for processing and retaining any application which is abandoned pursuant to §1.53(d). Such applications have received a filing date pursuant to 35 U.S.C. 111 but have been abandoned for failure to complete the application by filing the oath or declaration, filing fee or surcharge (§1.16(e)). The fee covers the handling, filming, processing, data input and storage required to retain an application. The fee is not due in any application in which the basic filing fee was paid.

Section 1.25 is amended as proposed to revise paragraph (a) to set the minimum deposit for a deposit account at $1000 and to clarify that an amount sufficient to cover all fees as well as services, copies, etc., requested must always be on deposit. This minimum amount is considered necessary and proper in view of the substantial increase in the amounts of fees being charged to deposit accounts and the processing costs of handling overdrawn accounts. Paragraph (b) clarifies that fees may be charged against a deposit account only where sufficient funds are on deposit to cover the entire amount of the fees. Paragraph (b) also clarifies that an authorization to charge a fee to a deposit account will not be considered payment on the date the authorization to charge is effective as to that fee unless sufficient funds are present in the account to cover the fee.

Section 1.27 is amended as proposed to revise paragraphs (b), (c) and (d) to provide clearly that an independent inventor, small business concern, or nonprofit organization, which is otherwise qualified as a small entity for purposes of paying reduced patent fees under 37 CFR 1.9 and 1.27, is not disqualified therefrom because of a license to a federal agency pursuant to 35 U.S.C. 202(c) (4). Section 1.27 is amended to state that such a license does not constitute a license or a conveyance of rights which would preclude qualifying for small entity status. The amendment is necessary for clarification and to avoid frustrating the intent of Public Law 97-247 and Public Law 96-517 when taken together.

The text of Title 35, United States Code, §202(c) (4) reads as follows:

§202. Disposition of rights

(c) Each funding agreement with a small business firm or nonprofit organization shall contain appropriate provisions to effectuate the following:

* * * * *

(4) With respect to any invention in which the contractor elects rights, the Federal agency shall have a nonexclusive, nontransferable, irrevocable, paid-up license to practice or have practiced for or on behalf of the United States any subject invention throughout the world, and may, if provided in the funding agreement, have additional rights to sublicense any foreign government or international organization pursuant to any existing or future treaty or agreement.

Section 1.28 is amended as proposed to revise paragraph (a) to clarify that a separate verified statement is not required to be filed in a file wrapper continuing application filed pursuant to §1.62, if status as a small entity has been established in the parent application and is still proper. Section 1.28(a) also permits a refund of a fee timely paid in the full amount if within two months of the date of the full timely payment: (1) small entity status is properly established, and (2) a refund is requested. Under §1.28(a), no request for a refund filed later than two months after the date on which a full fee has been paid will be entertained even if additional time is sought to file the request. The two-month period referred to in §1.28(a) is not a period for response under §1.136 and cannot be extended. Section 1.28(a) provides for, in somewhat modified form, the practice presently in effect pursuant to a waiver of §1.28 published at 1023 O.G. 77 on Oct. 26, 1982 and extended at 1027 O.G. 115 on Feb. 15, 1983. The revised refund procedures in §1.28(a) will apply to any fees timely paid in full on or after the effective date of the final rule. The refund procedures set forth in the Patent and Trademark Office *Official Gazette* Notice entitled "Filing of Verified Statements Claiming Small Entity Status" published at 1023 O.G. 77 on October 26, 1982, and the *Official Gazette* Notice entitled "Requirement for Filing Verified Statements Claiming Small Entity Status" published at 1027 O.G. 115 on Feb. 15, 1983, continue in effect until the effective date of the final rule.

Section 1.52(d) is amended as proposed to clarify that the verified English translation of a non-English language application and the fee set forth in §1.17(k) can be filed with the application or within such time as may be set by the Office.

Section 1.53, paragraphs (b) and (d), are amended to clarify in paragraph (b) that the application for patent must be filed in the name of the actual inventor or inventors by giving all their names as required by §1.41. Paragraph 1.53(d) states that if a correspondence address is provided, notice will be provided to that address where the appropriate filing fee or oath or declaration does not accompany the application. Paragraph 1.53(d) also provides that if the required filing fee is not paid, or the processing and retention fee is not paid, within one year of the date of mailing of notification pursuant to paragraph 1.53(d) or within one year from the filing date if no correspondence address is included in the application, the application will be disposed of. The paragraph further indicates that no copies will be provided or certified by the Office of an application which has been disposed of or in which neither the basic filing fee nor the processing fee has been paid. Finally, paragraph 1.53(d) specifies that if no correspondence address is included in the application, applicant will have two months from the filing date to file the fee, oath or declaration and to pay the surcharge set forth in §1.16(e) in order to prevent abandonment of the application.

Section 1.55, paragraph (b), is amended as proposed to correct an error in referring to paragraph (a) of this section.

Section 1.56 is amended as proposed to revise paragraph (b) and add a new paragraph (j). Paragraph 1.56(b) requires that a copy of each foreign patent document, non-patent publication, or other non-patent item of information in written form being disclosed pursuant to §1.56 accompany such disclosures unless the copy is not in the possession of the person making the disclosure. In such a situation, a statement to that effect is required. Paragraph 1.56(b) also adds "or her" to refer to both genders. New paragraph 1.56(j) states that applicant will be notified if a copy or statement required pursuant to §1.56(b) is not submitted and that applicant will be given a time period within which to file the copy or a statement that the copy is not in the possession of the person making the disclosure. Such a time period would be extendable under §1.136. Failure to respond in a proper and timely manner would result in abandonment of the application.

Section 1.59 is amended as proposed to clarify that the Office will furnish copies of papers received in the Office at the usual cost only if the basic filing fee or the processing and retention fee has been paid.

Section 1.60 is amended to break the section into paragraph (a) and new paragraph (b). Paragraph (a) adds a reference to amended §1.78(a) to clarify the conditions under which continuation or divisional applications may be filed. New paragraph 1.60(b) provides that the signing of the oath or declaration can be omitted if the prior application was complete as set forth in §1.51(a). New paragraph 1.60(b) also requires that a true copy of the prior complete application be filed. The final rule also clarifies that the copy of the oath or declaration filed must show the applicant's signature or contain an indication it was signed. Paragraph 1.60(b) also provides that only amendments reducing the number of claims or adding a reference to the prior application will be entered before calculating the filing fee and granting the filing date.

Section 1.62 is amended as proposed to revise paragraphs (a) and (d). Paragraph 1.62(a) provides that the file wrapper continuing procedure is applicable only to prior complete applications under §1.51(a). Paragraph 1.62(d) clarifies that the filing fee referred to is the basic filing fee.

Section 1.78 is amended as proposed to change the title to more explicitly define the contents of the section. Paragraph 1.78(a) specifies that in order for an application to claim the benefit of a prior filed copending national application, the prior application must be complete as set forth in §1.51(a) or be entitled to a filing date as set forth in §1.53(b) and include the basic filing fee set forth in §1 '6, or be entitled to a filing date as set forth in §1.53(b) and have paid the processing and retention fee set forth in §1.21(l) within the time period set forth in §1.53(d).

Section 1.121 is amended as proposed to revise paragraph (e) to specify how amendments to the description and claims are to be made in reissue applications.

Section 1.123 is amended as proposed to clarify that the sketch showing proposed amendments to the drawing with its cover letter should be a separate paper.

Section 1.135 is amended as proposed to remove paragraph (d) since it is not necessary in view of the ability to obtain extensions of time under §1.136(a) by petition and payment of fee.

Section 1.136 is amended as proposed to clarify in paragraphs (a) and (b) that the extension of time practice under this section does not apply in interference proceedings or in reexamination proceedings. Extension of time practice in interference proceedings, including extension of time for appeal or civil action (§1.304), is subject to §1.245. Extension of time practice in reexamination proceedings, including extension of time for appeal or civil action (§1.304), is subject to §1.550(c).

Section 1.191 is amended as proposed to add a new paragraph (d) to provide that the time periods for appeal and review set forth in §§1.191-1.194, 1.196 and 1.197 are subject to the provisions of §1.136 for patent applications or §1.550(c) for reexamination proceedings.

Section 1.192 is amended as proposed to revise paragraph (a) to delete the reference to §1.136 since it is provided for in new §1.191(d).

Section 1.197 is amended as proposed to revise paragraph (b) to delete the reference to §1.136 since it is provided for in new §1.191(d).

Section 1.304 is amended as proposed to clarify that extensions of time periods set forth therein are subject to the provisions of §1.245 for interferences or §1.550(c) where reexamination proceedings are involved rather than to §1.136 which applies in all other cases.

Section 1.550 is amended as proposed to revise paragraph (c) to clarify that the time for taking any action, including appeal, by a patent owner in a reexamination proceeding is governed solely by this section.

Section 1.555 is amended to revise paragraphs (a) and (b). In paragraph 1.555(a) "prior art" statement has been changed to "information disclosure" statement to conform to the language of §1.98. Paragraph 1.555(b) requires that disclosures pursuant to this paragraph be accompanied by a copy of each foreign patent document or non-patent printed publication which is being disclosed and which is in the possession of the person making the disclosure.

Responses to Comments on the Rules

Specific comments were received on a number of the sections. Thirty-five letters presenting written comments were received. No oral testimony was presented at the public hearing conducted on Oct. 18, 1983. All of the comments were considered in adopting the changes set forth herein. Comments appear below with responses thereto.

Comments from Associations

Comment:

The American Patent Law Association commented that they were in full accord with most of the proposed changes. They submitted comments and suggestions from some members. The Patent, Trademark and Copyright Section of the American Bar Association did not render an official section position on the proposed rule changes but polled its members and found the majority of the member responding either to favor the proposed rule changes or to view them as acceptable. They also submitted comments and suggestions from some members. The United States Trademark Association commented on the proposed rules concerning deposit accounts.

Reply:

The efforts and input of these organizations are appreciated. Specific comments and suggestions from individual members of the organizations are covered below.

Comments from Individuals

Comment:

One comment was received that the proposed amendment to §1.6 was unnecessary and possibly improper.

Reply:

The amendment to §1.6 has been adopted as proposed. The amended rule sets out the Patent and Trademark Office practice which has been in effect. No papers are stamped as having arrived in the Office on Saturday, Sunday, or a federal holiday within the District of Columbia no matter how the papers are filed. Article 4, C(3) of the Paris Convention says that the period of priority shall be extended until the first following working day "when the Office is not open for the filing of applications in the country where protection is claimed". To accept papers through use of "Express Mail" or some other way on Saturdays, Sundays or federal holidays within the District of Columbia would raise the possibility that the Office would be viewed as open for the filing of papers on such days and thereby remove the current ability to file a priority claiming application on the first working day if the priority year ended on a non-working day. The final rule avoids this implication.

Comment:

One comment indicated that the change to §1.6 should not be applied retroactively to papers filed before the clarifying language was placed in the rule.

Reply:

Any such fact situation will be reviewed through the normal petition procedure.

Comment:

One comment suggested that §1.10 be amended rather than §1.6 with regard to papers deposited as "Express Mail" on a Saturday, Sunday, or federal holiday within the District of Columbia.

Reply:

This comment has been adopted in that both §§1.6 and 1.10 have been amended to avoid any possible confusion.

Comment:

One comment suggested that §1.19(b) (3) be changed to permit the Office to certify material not copied from the records of the Office when reproduction of Office records is not feasible or possible.

Reply:

This comment has not been adopted. The Office will only certify that material is a copy of an Office record if, in fact, the material was reproduced from the Office record.

Comment:

One person commented that the $100 processing and retention fee under §1.21 was excessive and unnecessary.

Reply:

The fee is considered proper and necessary in view of the cost to the Office in handling, filming, processing and storage required to retain an application which has a filing date but in which no basic filing fee has been paid. If this expense is not covered by the applicant, it must be recovered from other sources.

Comment:

Twenty-seven comments were received on the proposal to amend §1.25 to raise to $1000 the minimum balance required in a deposit account. The amount is also referred to in §1.21(b) (2). These comments generally suggested that the $1000 amount was too high for account holders who did not use their accounts for charges other than small fees such as for patent copies. Several comments received acknowledged that the minimum balance for deposit accounts should be raised and suggested various amounts less than the proposed $1000. Several comments suggested a separate account category for persons who do not use their accounts for other than small fees. Two comments suggested that the Office accept credit cards for payment of fees.

Reply:

These comments and suggestions have not been adopted. The fees for filing, processing and issuing of patent and trademark applications have increased so as to make the present $40 minimum balance for deposit accounts totally inadequate. A number of persons objecting to the $1000 minimum balance acknowledged that they used their deposit accounts as a safeguard against failure to calculate or to submit proper fees by a check. An account with a very low balance obviously cannot be effective as a safeguard when a patent filing fee is $300 and a patent issue fee is $500. Dealing with overdrawn accounts causes administrative problems for the Patent and Trademark Office. An authorization to charge an account without sufficient funds to cover a charge will not be effective as payment and may result in loss of rights to an applicant. Also, unnecessary expense will be incurred by an applicant if an insufficient balance in an account results in abandonment of an application and the necessity of filing a petition to revive under 37 CFR 1.137(b) with the requisite $500 fee. Experience has shown that many single practitioners and small firms have failed to have sufficient funds in their accounts when needed. The increase of the minimum balance in deposit accounts to $1000 is seen to be necessary and proper. A failure to raise the minimum balance in deposit accounts to $1000 would serve as an incorrect indication that the Patent and Trademark Office views a minimum balance of less than $1000 as acceptable. If it is not possible for a small firm or individual to maintain

a minimum balance of $1000, the deposit account could still be retained and used by paying the service charge set forth in §1.21(b) (2) for any month in which the balance at the end of the month is below $1000. The use of credit cards is not considered viable since legislation would be required to do so.

Comment:

Two comments were received suggesting that a license to a federal agency in an invention made by a federal employee should not preclude the employee from qualifying as a small entity and that §1.27 should be amended to cover this situation.

Reply:

These comments have not been adopted. Such an amendment was not proposed and the public has not had an opportunity to comment on it.

Comment:

One comment suggested that the time for filing a verified statement claiming small entity status to obtain a refund of a filing fee pursuant to §1.28 should run from the date of mailing of the filing receipt due to difficulty in identifying the new application before the filing receipt is received. Three persons suggested that the period for establishing small entity status and requesting a refund should be three months rather than two months as proposed.

Reply:

These comments have not been adopted. An application may be identified before the filing receipt is issued in a number of ways including title, inventor's name, filing date and attorney docket number. Also, a postcard may be included with filing of the application to learn the application serial number. The two month period for obtaining a refund is seen to be adequate since the small entity practice is no longer new and the public has had time to become familiar with it. It allows sufficient time to have a small entity statement executed and sent to the Patent and Trademark Office.

Comment:

One comment suggested that it should be made clear that an application filed in a foreign language (§1.52(d)) without including a signed oath or declaration can receive a filing date under the provisions of §1.53(b).

Reply:

The regulations permit and this reply makes it clear that an application filed in a language other than English can receive a filing date by complying with §1.53(b).

Comment:

Three comments were received suggesting that the proposed language not be added to §1.53(b). One comment alleged that the requirement to name the inventors upon filing a patent application is not required or even authorized by statute.

Reply:

35 U.S.C. 111 says that application for patent "shall be made, or authorized to be made, by the inventor". The rules of practice (§1.41(a)) contain the same requirement. The amendment to §1.53(b) is only clarifying the rules by also placing the requirement in that section. Further, United States patent practice has long required that the inventors be named at the time of filing.

Comment:

One person commented that the language of §1.53(d) should be changed to reflect that only one of the filing fee or processing and retention fee must be paid to prevent the application being disposed of.

Reply:

The language of the rule is seen to be unambiguous in this regard.

Comment:

One person commented that the language of §1.53(d) should be changed to establish a time within which the processing and retention fee may be paid to prevent the application being disposed of when no correspondence address has been provided.

Reply:

The suggestion has been adopted.

Comment:

One person suggested that §1.56(b) which states that copies of disclosed documents must be filed is inconsistent with §1.56(j) which provides that such copies must be filed unless they are not in the possession of the person making the disclosure.

Reply:

The language of §1.56(b) has been modified to clarify this point.

Comment:

Three persons commented that the requirement of §1.56(b) that copies of disclosed documents be supplied was an unnecessary burden. One person commented similarly on the requirement of §1.555 that copies of disclosed documents be supplied. Another person suggested that the proposed amendment to §1.56(b) would require submission of a complete document even if only a small portion were relevant.

Reply:

The Office agrees with another person who commented that the "requirement that disclosers in application and reexamination proceedings provide copies of disclosed documents which they have is fair and reasonable and should aid the Examiner in making an informed as possible decision in any given proceeding". The portion of a document required to be submitted under §1.56(b) is the portion which is material to the examination of the application under §1.56(a).

Comment:

One person commented that the proposed amendment to §1.78(a) would appear to require that a petition for correction of inventorship under §1.48 be filed in a parent application as well as in the continuing application in which the inventorship was corrected.

Reply:

The amendment to §1.78 does not change the practice regarding the filing of petitions under §1.48.

Comment:

One person commented that §1.123 is unclear as amended in not referring to the paper requesting that amendments to the drawing be made.

Reply:

The Patent and Trademark Office no longer makes amendments to the drawings. Applicants must submit new drawings with the changes or use bonded draftsmen to make the amendments. A paper requesting that the Office make the amendments is therefore inappropriate.

Comment:

Four persons commented that §1.135(d) should not be deleted since they thought it desirable to be able to ratify unsigned papers without paying any fee.

Reply:

The statute and rules now provide for obtaining extensions of time through simple petition and payment of fee and for revival through a simple statement that the abandonment was unintentional and the payment of a fee. Further, a filing date can now be obtained on filing an application without the oath or declaration. The handling of unsigned papers by the Patent and Trademark Office causes administrative problems and expense to the Office and delays the processing of applications. The emergency-type situations involving loss of rights which the previous practice was intended to cover have been substantially eliminated by the changes in the law and rules.

Comment:

One person commented that §1.191(d) was undecipherable in that it refers to a number of other rules.

Reply:

This section was intended to serve as a point of summarization for the applicable extension of time rules in appeals before the Board of Appeals. The section is seen

to adequately serve that purpose.

Comment:

One person commented that the final sentence of §1.555(b) needs clarification.

Reply:

This sentence was not changed by the proposed rules and is seen to be clear as written.

Comment:

One person commented that proposed §1.555(b) requires copies and does not make any exceptions or qualifications on this requirement.

Reply:

The language of §1.555(b) has been clarified to require filing of a copy of each foreign patent document or nonpatent printed publication which is being disclosed and which is in the possession of the person making the disclosure.

Environmental, energy, and other considerations: The rule change will not have a significant impact on the quality of the human environment or the conservation of energy resources.

The rule change is in conformity with the requirements of the Regulatory Flexibility Act (Pub. L. 96-354), Executive Order 12291, and the Paperwork Reduction Act of 1980, 44 U.S.C. 3501 *et. seq.*

The General Counsel of the Department of Commerce certified to the Small Business Administration that the rule change will not have a significant adverse economic impact on a substantial number of small entities (Regulatory Flexibility Act. Pub. L. 96-354). Public Laws 96-517 and 97-247 have both taken into consideration the impact they may have on small entities.

The Patent and Trademark Office has determined that this rule change is not a major rule under Executive Order 12291. The annual effect on the economy will be less than $100 million. There will be no major increase in costs or prices for consumers, individual industries, federal, state, or local government agencies, or geographic regions. There will be no significant adverse effects on competition, employment, investment, productivity, innovation, or on the ability of United States-based enterprises to compete with foreign-based enterprises in domestic or export markets.

This rule change will not impose a burden under the Paperwork Reduction Act of 1980, 44 U.S.C. 3501 *et. seq.*, since no significant additional record keeping or reporting requirements are placed upon the public. In fact, some paperwork, especially that related to filing of small entity statements in applications filed under §1.62 will be reduced.

List of Subjects in 37 CFR Part 1

Administrative practice and procedure, Authority delegations (government agencies), Conflict of interests, Courts, Inventions and patents, Lawyers.

Notice is hereby given that, pursuant to the authority granted to the Commissioner of Patents and Trademarks by 35 U.S.C. 6 and Public Law 97-247, the Patent and Trademark Office is amending Title 37 of the Code of Federal Regulations as set forth below.

37 CFR, Part 1, is amended as follows:

1. Section 1.5 is amended by revising paragraph (a) to read as follows:

§1.5 Identification of application, patent or registration.

(a) When a letter concerns an application for patent, it should state the name of the applicant, the title of the invention, the serial number or international application number of the application, the date of filing the same, and, if known, the group art unit or other unit within the Patent and Trademark Office responsible for considering the letter and the name of the examiner or other person to which it has been assigned.

* * * * *

2. Section 1.6 is amended by revising paragraph (a) to read as follows:

§1.6 Receipt of letters and papers.

(a) Letters and other papers received in the Patent and Trademark Office are stamped with the date of receipt except where such letters and papers are filed in accordance with §1.10. Any such letters and papers filed in accordance with §1.10 will be stamped with the date of deposit as "Express Mail" with the United States Postal Service unless the date of deposit is a Saturday, Sunday, or federal holiday within the District of Columbia in which case the date stamped will be the next succeeding day which is not a Saturday, Sunday, or federal holiday within the District of Columbia. No papers are received in the Patent and Trademark Office on Saturdays, Sundays or federal holidays within the District of Columbia.

* * * * *

3. Section 1.10 is amended by revising paragraphs (a) and (c) to read as follows:

§1.10 Filing of papers and fees by "Express Mail" with certificate.

(a) Any paper or fee to be filed in the Patent and Trademark Office can be filed utilizing the "Express Mail Post Office to Addressee" service of the United States Postal Service and be considered as having been filed in the Office on the date the paper or fee is shown to have been deposited as "Express Mail" with the United States Postal Service unless the date of deposit is a Saturday, Sunday, or federal holiday within the District of Columbia. See §1.6(a).

* * * * *

(c) The Patent and Trademark Office will accept the certificate of mailing by "Express Mail" and accord the paper or fee the certificate date under 35 U.S.C. 21(a) (unless the certificate date is a Saturday, Sunday, or federal holiday within the District of Columbia—see §1.6(a)) without further proof of the date on which the mailing by "Express Mail" occurred unless a question is present regarding the date of mailing. If more than a reasonable time has elapsed between the certificate date and the Patent and Trademark Office receipt date or if other questions regarding the date of mailing are present, the person mailing the paper or fee may be required to file a copy of the "Express Mail" receipt showing the actual date of mailing and a statement from the person who mailed the paper or fee averring to the fact that the mailing occurred on the date certified. Such statement must be a verified statement if made by a person not registered to practice before the Patent and Trademark Office.

4. Section 1.14 is amended by revising paragraph (b) to read as follows:

§1.14 Patent applications preserved in secrecy.

* * * * *

(b) Except as provided in §1.11(b) abandoned applications are likewise not open to public inspection, except that if an application referred to in a U.S. patent, or in an application which is open to inspection pursuant to §1.139, is abandoned and is available, it may be insepcted or copies obtained by any person on written request, without notice to the applicant. Complete applications (§1.51(a)) which are abandoned may be destroyed after 20 years from their filing date, except those to which particular attention has been called and which have been marked for preservation. Abandoned applications will not be returned.

* * * * *

5. Section 1.19 is amended by revising paragraph (b) (3) to read as follows:

§1.19 Document supply fees.

* * * * *

(b) * * *

(3) For comparing copies, made from Patent and Trademark Office records but not prepared by the Patent and Trademark

Office, with the original, prior to certification of the copies, per page $0.10

* * * * *

6. Section 1.21 is amended by revising paragraph (b)(2) and by adding a new paragraph (l) to read as follows:

§1.21 Miscellaneous fees and charges.

* * * * *

(b) * * *

(2) Service charge for each month when the balance at the end of the month is below $1000 . . . . . $2.00

* * * * *

(l) For processing and retaining any application abandoned pursuant to §1.53(d) unless the required basic filing fee has been paid . . . . . $100.00.

7. Section 1.25 is revised to read as follows:

§1.25 Deposit accounts.

(a) For the convenience of attorneys, agents, and the general public in paying any fees due, in ordering services offered by the Office, copies of records, etc., deposit accounts may be established in the Patent and Trademark Office upon payment of the fee for establishing a deposit account (§1.21(b)(1)). A minimum deposit of $1000 or more, depending on the activity of the individual account, is required. At the close of each month's business, a statement will be rendered. A remittance must be made promptly upon receipt of the statement to cover the value of items or services charged to the account and thus restore the account to its established normal deposit value. An amount sufficient to cover all fees, services, copies, etc., requested must always be on deposit. A service charge (§1.21(b)(2)) will be assessed for each month that the balance at the end of the month is below $1000.

(b) Filing, issue, appeal, international-type search report, international application processing, petition, and post-issuance fees may be charged against these accounts if sufficient funds are on deposit to cover such fees. A general authorization to charge all fees, or only certain fees, set forth in §§1.16 to 1.18 to a deposit account containing sufficient funds may be filed in an individual application, either for the entire pendency of the application or with respect to a particular paper filed. An authorization to charge to a deposit account the fee for a request for reexamination pursuant to §1.510 and any other fees required in a reexamination proceeding in a patent may also be filed with the request for reexamination. An authorization to charge a fee to a deposit account will not be considered payment of the fee on the date the authorization to charge the fee is effective as to the particular fee to be charged unless sufficient funds are present in the account to cover the fee.

8. Section 1.27 is amended by revising paragraphs (b), (c) and (d) to read as follows:

§1.27 Statement of status as small entity.

* * * * *

(b) Any verified statement filed pursuant to paragraph (a) of this section on behalf of an independent inventor must be signed by the independent inventor except as provided in §§1.42, 1.43, or 1.47 of this part, and must aver that the inventor qualifies as an independent inventor in accordance with §1.9(c) of this part. Where there are joint inventors in an application, each inventor must file a verified statement establishing status as an independent inventor in order to qualify as a small entity. Where any rights have been assigned, granted, conveyed, or licensed, or there is an obligation to assign, grant, convey, or license, any rights to a small business concern, a nonprofit organization, or any other individual, a verified statement must be filed by the individual, the owner of the small business concern, or an official of the small business concern or nonprofit organization empowered to act on behalf of the small business concern or nonprofit organization averring to their status. For purposes of a verified statement under this paragraph, a license to a federal agency resulting from a funding agreement with that agency pursuant to 35 U.S.C. 202(c)(4) does not constitute a license as set forth in §1.9 of this part.

(c) Any verified statement filed pursuant to paragraph (a) of this section on behalf of a small business concern must (1) be signed by the owner or an official of the small business concern empowered to act on behalf of the concern; (2) aver that the concern qualifies as a small business concern as defined in §1.9(d); and (3) aver that exclusive rights to the invention have been conveyed to and remain with the small business concern, or if the rights are not exclusive, that all other rights belong to small entities as defined in §1.9. Where the rights of the small business concern as a small entity are not exclusive, a verified statement must also be filed by the other small entities having rights averring to their status as such. For purposes of a verified statement under this paragraph, a license to a federal agency resulting from a funding agreement with that agency pursuant to 35 U.S.C. 202(c)(4) does not constitute a license as set forth in §1.9 of this part.

(d) Any verified statement filed pursuant to paragraph (a) of this section on behalf of a nonprofit organization must (1) be signed by an official of the nonprofit organization empowered to act on behalf of the organization; (2) aver that the organization qualifies as a nonprofit organization as defined in §1.9(e) of this part specifying under which one of §1.9(e)(1), (e)(2), (e)(3), or (e)(4) of this part the organization qualifies; and (3) aver that exclusive rights to the invention have been conveyed to and remain with the organization or if the rights are not exclusive, that all other rights belong to small entities as defined in §1.9 of this part. Where the rights of the nonprofit organization as a small entity are not exclusive, a verified statement must also be filed by the other small entities having rights averring to their status as such. For purposes of a verified statement under this paragraph, a license to a federal agency resulting from a funding agreement with that agency pursuant to 35 U.S.C. 202(c)(4) does not constitute a conveyance of rights as set forth in this paragraph.

9. Section 1.28 is amended by revising paragraph (a) to read as follows:

§1.28 Effect on fees of failure to establish status, or change status, as a small entity.

(a) The failure to establish status as a small entity (§§1.9(f) and 1.27 of this part) in any application or patent prior to paying, or at the time of paying, any fee precludes payment of the fee in the amount established for small entities. A refund pursuant to §1.26 of this part, based on establishment of small entity status, of a portion of fees timely paid in full prior to establishing status as a small entity may only be obtained if a verified statement under §1.27 and a request for a refund of the excess amount are filed within two months of the date of the timely payment of the full fee. The two-month time period is not extendable under §1.136. Status as a small entity is waived for any fee by the failure to establish the status prior to paying, at the time of paying, or within two months of the date of payment of, the fee. Status as a small entity must be specifically established by a verified statement filed in each application or patent in which the status is available and desired, except those applications filed under §1.60 or §1.62 of this part where the status as a small entity has been established in a parent application and is still proper. Once status as a small entity has been established in an application or patent, the status remains in that application or patent without the filing of a further verified statement pursuant to §1.27 of this part unless the Office is notified of a change in status. Status as a small entity in one application or patent does not affect any other application or patent, including applications or patents which are directly or indirectly dependent upon the application or patent in which the status has been established, except

those filed under §1.60 or §1.62 of this part. Applications filed under §1.60 or §1.62 of this part must include a reference to a verified statement in a parent application if status as a small entity is still proper and desired.

* * * * *

10. Section 1.52 is amended by revising paragraph (d) to read as follows:

§1.52 Language, paper, writing, margins.

* * * * *

(d) An application may be filed in a language other than English. A verified English translation of the non-English language application and the fee set forth in §1.17(k) are required to be filed with the application or within such time as may be set by the Office.

11. Section 1.53 is amended by revising paragraphs (b) and (d) to read as follows:

§1.53 Serial number, filing date, and completion of application.

* * * * *

(b) The filing date of an application for patent is the date on which (1) a specification containing a description pursuant to §1.71 and at least one claim pursuant to §1.75, and (2) any drawing required by §1.81(a), are filed in the Patent and Trademark Office in the name of the actual inventor or inventors as required by §1.41. No new matter may be introduced into an application after its filing date (§1.118).

* * * * *

(d) If the application which has been accorded a filing date pursuant to paragraph (b) of this section does not include the appropriate filing fee or an oath or declaration by the applicant, applicant will be so notified, if a correspondence address has been provided, and given a period of time within which to file the fee, oath, or declaration and to pay the surcharge as set forth in §1.16(e) in order to prevent abandonment of the application. If the required filing fee is not timely paid, or if the processing and retention fee set forth in §1.21(1) is not paid within one year of the date of mailing of the notification required by this paragraph, the application will be disposed of. No copies will be provided or certified by the Office of an application which has been disposed of or in which neither the required basic filing fee nor the processing and retention fee has been paid. The notification pursuant to this paragraph may be made simultaneously with any notification pursuant to paragraph (c) of this section. If no correspondence address is included in the application, applicant has two months from the filing date to file the fee, oath or declaration and to pay the surcharge as set forth in §1.16(e) in order to prevent abandonment of the application or one year from the filing date to pay the processing and retention fee set forth in §1.21(1) to prevent disposal of the application.

* * * * *

12. Section 1.55 is amended by revising paragraph (b) to read as follows:

§1.55 Claim for foreign priority.

* * * * *

(b) An applicant may under certain circumstances claim priority on the basis of an application for an inventor's certificate in a country granting both inventor's certificates and patents. When an applicant wishes to claim the right of priority as to a claim or claims of the application on the basis of an application for an inventor's certificate in such a country under 35 U.S.C. 119, last paragraph (as amended July 28, 1972), the applicant or his or her attorney or agent, when submitting a claim for such right as specified in paragraph (a) of this section, shall include an affidavit or declaration including a specific statement that, upon an investigation, he or she has satisfied himself or herself that to the best of his or her knowledge the applicant, when filing his or her application for the inventor's certificate, had the option to file an application either for a patent or an inventor's certificate as to the subject matter of the identified claim or claims forming the basis for the claim of priority.

13. Section 1.56 is amended by revising paragraph (b) and by adding a new paragraph (j) to read as follows:

§1.56 Duty of disclosure; fraud; striking or rejection of applications.

* * * * *

(b) Disclosures pursuant to this section must be accompanied by a copy of each foreign patent document, non-patent publication, or other non-patent item of information in written form which is being disclosed or by a statement that the copy is not in the possession of the person making the disclosure and may be made to the Office through an attorney or agent having responsibility for the preparation or prosecution of the application or through an inventor who is acting in his or her own behalf. Disclosure to such an attorney, agent or inventor shall satisfy the duty, with respect to the information disclosed, of any other individual. Such an attorney, agent or inventor has no duty to transmit information which is not material to the examination of the application.

* * * * *

(j) If any disclosure pursuant to this section does not include a copy of each foreign patent document, non-patent publication, or other non-patent item of information in written form which is being disclosed or a statement that a copy thereof is not in the possession of the person making the disclosure, applicant will be so notified and given a period of time within which to file the copy or a statement that a copy is not in the possession of the person making the disclosure. The time period set may be extended under §1.136.

14. Section 1.59 is revised to read as follows:

§1.59 Papers of application with filing date not to be returned.

Papers in an application which has received a filing date pursuant to §1.53 will not be returned for any purpose whatever. If applicants have not preserved copies of the papers, the Office will furnish copies at the usual cost of any application in which either the required basic filing fee (§1.16) or the processing and retention fee (§1.21(1)) has been paid.

15. Section 1.60 is revised to read as follows:

§1.60 Continuation or divisional application for invention disclosed in a prior application.

(a) A continuation or divisional application (filed under the conditions specified in 35 U.S.C. 120 or 121 and §1.78(a)), which discloses and claims only subject matter disclosed in a prior application may be filed as a separate application before the patenting or abandonment of or termination of proceedings on the prior application.

(b) An applicant may omit signing of the oath or declaration in a continuation or divisional application if (1) the prior application was a complete application as set forth in §1.51(a) and (2) applicant files a true copy of the prior complete application as filed including the specification (including claims), drawings, oath or declaration showing the applicant's signature or an indication it was signed, and any amendments referred to in the oath or declaration filed to complete the prior application. The copy of the prior application must be accompanied by a statement that the application papers filed are a true copy of the prior application and that no amendments referred to in the oath or declaration filed to complete the prior application introduced new matter therein. Such statement must be by the applicant or applicant's attorney or agent and must be a verified statement if made by a person not registered to practice before the Patent and Trademark Office. Only amendments reducing the number of claims or adding a reference to the prior application (§1.78(a)) will be entered before calculating the filing fee and granting the filing date.

16. Section 1.62 is amended by revising paragraphs (a) and (d) to read as follows:

§1.62 File wrapper continuing procedure.

(a) A continuation, continuation-in-part, or divisional application, which uses the specification, drawings and oath or declaration from a prior complete application (§1.51(a)) to be abandoned, may be filed before the payment of the issue fee, abandonment of, or termination of proceedings on the prior application. The filing date of an application filed under this section is the date on which a request is filed for an application under this section including identification of the Serial Number, filing date, and applicant's name of the prior complete application.

* * * * *

(d) If an application which has been accorded a filing date pursuant to paragraph (a) of this section does not include the appropriate basic filing fee pursuant to paragraph (b) of this section, or an oath or declaration by the applicant in the case of a continuation-in-part application pursuant to paragraph (c) of this section, applicant will be so notified and given a period of time within which to file the fee, oath, or declaration and to pay the surcharge as set forth in §1.16(e) in order to prevent abandonment of the application. The notification pursuant to this paragraph may be made simultaneously with any notification of a defect pursuant to paragraph (a) of this section.

* * * * *

17. Section 1.78 is amended by revising the title and paragraph (a) to read as follows:

§1.78 Claiming benefit of earlier filing date and cross-references to other applications.

(a) An application may claim an invention disclosed in the same applicant's prior filed copending national application or international application designating the United States of America. In order for an application to claim the benefit of a prior filed copending national application, the prior application must be (1) complete as set forth in §1.51, or (2) entitled to a filing date as set forth in §1.53(b) and include the basic filing fee set forth in §1.16; or (3) entitled to a filing date as set forth in §1.53(b) and have paid therein the processing and retention fee set forth in §1.21(l) within the time period set forth in §1.53(d). Any application claiming the benefit of a prior filed copending national or international application must contain or be amended to contain in the first sentence of the specification following the title a reference to such prior application, identifying it by serial number and filing date or international application number and international filing date and indicating the relationship of the applications. Cross-references to other related applications may be made when appropriate. (See §1.14(b)).

* * * * *

18. Section 1.121 is amended by revising paragraph (e) to read as follows:

§1.121 Manner of making amendments.

* * * * *

(e) In reissue applications, both the descriptive portion and the claims are to be amended by either (1) submitting a copy of a portion of the description or an entire claim with all matter to be deleted from the patent being placed between brackets and all matter to be added to the patent being underlined, or (2) indicating the exact word or words to be stricken out or inserted and the precise point where the deletion or insertion is to be made. Any word or words to be inserted must be underlined. See §1.173.

* * * * *

19. Section 1.123 is revised to read as follows:

§1.123 Amendments to the drawing.

No change in the drawing may be made except by permission of the Office. Permissible changes in the construction shown in any drawing may be made only by bonded draftsmen, at applicant's expense, or by the submission of substitute drawings by applicant. A sketch in permanent ink showing proposed changes, to become part of the record, must be filed for approval by the examiner and should be a separate paper.

20. Section 1.135 is amended by removing paragraph (d).

21. Section 1.136 is revised to read as follows:

§1.136 Filing of timely responses with petition and fee for extension of time and extensions of time for cause.

(a) If an applicant is required to respond within a non-statutory or shortened statutory time period, applicant may respond up to four months after the time period set if a petition for an extension of time and the fee set in §1.17 are filed prior to or with the response, unless (1) applicant is notified otherwise in an Office action or (2) the application is involved in an interference declared pursuant to §1.207 . The date on which the response, the petition, and the fee have been filed is the date of the response and also the date for purposes of determining the period of extension and the corresponding amount of the fee. The expiration of the time period is determined by the amount of the fee paid. In no case may an applicant respond later than the maximum time period set by statute, or be granted an extension of time under paragraph (b) of this section when the provisions of this paragraph are available. See §1.245 for extension of time in interference proceedings and §1.550(c) for extension of time in reexamination proceedings.

(b) When a response with petition and fee for extension of time cannot be filed pursuant to paragraph (a) of this section, the time for response will be extended only for sufficient cause, and for a reasonable time specified. Any request for such extension must be filed on or before the day on which action by the applicant is due, but in no case will the mere filing of the request effect any extension. In no case can any extension carry the date on which response to an Office action is due beyond the maximum time period set by statute or be granted when the provisions of paragraph (a) of this section are available. See §1.245 for extension of time in interference proceedings and §1.550(c) for extension of time in reexamination proceedings.

22. Section 1.191 is amended by adding a new paragraph (d) to read as follows:

§1.191 Appeal to Board of Appeals.

* * * * *

(d) The time periods set forth in §§1.191 through 1.194, 1.196 and 1.197 are subject to the provisions of §1.136 for patent applications or §1.550(c) for reexamination proceedings.

23. Section 1.192 is amended by revising paragraph (a) to read as follows:

§1.192 Appellant's brief.

(a) The appellant shall, within 2 months from the date of the notice of appeal under §1.191 in an application, reissue application, or patent under reexamination, or within the time allowed for response to the action appealed from, if such time is later, file a brief in triplicate. The brief must be accompanied by the requisite fee set forth in §1.17(f) and must set forth the authorities and arguments on which the appellant will rely to maintain the appeal. The brief must include a concise explanation of the invention which should refer to the drawing by reference characters, and a copy of the claims involved.

* * * * *

24. Section 1.197 is amended by revising paragraph (b) to read as follows:

§1.197 Action following decision.

* * * * *

(b) A single request for rehearing or reconsideration, or modification of the decision, may be made if filed within thirty days from the date of the original decision, unless that decision is so modified as to become, in effect, a new decision, and the Board of Appeals so states.

* * * * *

25. Section 1.304 is amended by revising paragraph (a) to read as follows:

§1.304 Time for appeal or civil action.

(a) The time for filing the notice and reasons of appeal to the U.S. Court of Appeals for the Federal Circuit (§1.302) or for commencing a civil action (§1.303) is sixty days from the date of the decision of the Board of Appeals or the Board of Patent Interferences. If a request for rehearing or reconsideration, or modification of the decision, is filed within the time provided pursuant to §1.197(b) or §1.256(b), the time for filing an appeal or commencing a civil action shall expire at the end of the sixty-day period or thirty days after action on the request, whichever is later. The time periods set forth herein are subject to the provisions of §1.136 or §1.550(c) as to decisions of the Board of Appeals, or §1.245 as to decisions of the Board of Patent Interferences.

* * * * *

26. Section 1.550 is amended by revising paragraph (c) to read as follows:

§1.550 Conduct of reexamination proceedings.

* * * * *

(c) The time for taking any action by a patent owner in a reexamination proceeding will be extended only for sufficient cause, and for a reasonable time specified. Any request for such extension must be filed on or before the day on which action by the patent owner is due, but in no case will the mere filing of the request effect any extension.

* * * * *

27. Section 1.555 is amended by revising paragraphs (a) and (b) to read as follows:

§1.555 Duty of disclosure in reexamination proceedings.

(a) A duty of candor and good faith toward the Patent and Trademark Office rests on the patent owner, on each attorney or agent who represents the patent owner, and on every other individual who is substantively involved on behalf of the patent owner in a reexamination proceeding. All such individuals who are aware, or become aware, of patents or printed publications material to the reexamination which have not been previously made of record in the patent file must bring such patents or printed publications to the attention of the Office. An information disclosure statement, preferably in accordance with §1.98, should be filed wihin two months of the date of the order for reexamination, or as soon thereafter as possible in order to bring such patents or printed publications to the attention of the Office.

(b) Disclosures pursuant to this section must be accompanied by a copy of each foreign patent document or non-patent printed publication which is being disclosed or by a statement that the copy is not in the possession of the person making the disclosure and may be made to the Office through an attorney or agent having responsibility on behalf of the patent owner for the reexamination proceeding or through a patent owner acting in his or her own behalf. Disclosure to such an attorney, agent or patent owner shall satisfy the duty of any other individual. Such an attorney, agent or patent owner has no duty to transmit information which is not material to the reexamination.

* * * * *

Nov. 30, 1983.

GERALD J. MOSSINGHOFF,
Commissioner of Patents and Trademarks.

(Published in the Federal Register on Jan. 4, 1984 as Part II)

PATENT NOTICES

Certificates of Correction for the Week of Jan. 24, 1984

D. 270,000	4,377,699	4,394,192	4,408,583
3,613,902	4,378,970	4,394,964	4,408,689
4,210,264	4,379,170	4,395,325	4,408,792
4,255,328	4,380,598	4,396,412	4,409,037
4,268,253	4,381,297	4,396,474	4,410,577
4,283,499	4,382,463	4,396,781	4,410,699
4,296,484	4,383,933	4,396,831	4,411,523
4,303,537	4,384,214	4,397,709	4,412,062
4,311,812	4,385,353	4,397,920	4,412,343
4,332,802	4,385,822	4,398,000	4,412,627
4,333,814	4,386,955	4,398,824	4,412,995
4,341,955	4,387,243	4,399,057	4,414,007
4,342,699	4,388,755	4,402,004	4,414,136
4,348,004	4,389,406	4,402,081	4,414,173
4,348,736	4,389,973	4,402,585	4,414,258
4,358,492	4,390,837	4,403,634	4,414,852
4,365,268	4,390,962	4,403,954	4,415,317
4,368,070	4,391,765	4,404,011	4,416,112
4,370,457	4,391,828	4,404,349	4,417,416
4,372,374	4,392,003	4,404,670	4,417,994
4,374,410	4,392,145	4,405,285	
4,375,995	4,393,271	4,406,309	
4,376,534	4,394,138	4,407,576	

1038 OG 284

Disclaimer

4,407,196.—*Harshad D. Matalia,* Easton, Pa., and *Menashe Navi,* New York, N.Y. METHOD OF ENHANCING INKING IN OFFSET PRESSES. Patent dated Oct. 4, 1983. Disclaimer filed July 21, 1983, by the assignee, *American Newspaper Publishers Association.*

The term of this patent subsequent to Feb. 15, 2000, has been disclaimed.

Reference Collections of U.S. Patents Available for Public Use in Patent Depository Libraries

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Owing to variations in the scope of patent collections among the patent depository libraries and in their hours of service to the public, anyone contemplating use of the patents at a particular library is advised to contact that library, in advance, about its collection and hours, so as to avert possible inconvenience.

State	*Name of Library*	*Telephone Contact*
Alabama	Auburn University Libraries	(205) 826-4500 Ext.21
	Birmingham Public Library	(205) 254-2555
Arizona	Tempe: Science Library, Arizona State University	(602) 965-7140
California	Los Angeles Public Library	(213) 626-7555 Ext. 273
	Sacramento: California State Library	(916) 322-4572
	Sunnyvale: Patent Information Clearinghouse*	(408) 738-5580
Colorado	Denver Public Library	(303) 571-2122
Delaware	Newark: University of Delaware	(302) 738-2238
Georgia	Atlanta: Price Gilbert Memorial Library, Georgia Institute of Technology	(404) 894-4508
Idaho	Moscow: University of Idaho Library	(208) 885-6235
Illinois	Chicago Public Library	(312) 269-2865
Indiana	Indianapolis—Marion County Public Library	(317) 269-1706
Louisiana	Baton Rouge: Troy H. Middleton Library, Louisiana State University	(504) 388-2570
Massachusetts	Boston Public Library	(617) 536-5400 Ext. 265
Michigan	Ann Arbor: Engineering Transportation Library, University of Michigan	(313) 704-7494
	Detroit Public Library	(313) 833-1450
Minnesota	Minneapolis Public Library & Information Center	(612) 372-6570
Missouri	Kansas City: Linda Hall Library	(816) 363-4600
	St. Louis Public Library	(314) 241-2288 Ext. 390, Ext. 391
Nebraska	Lincoln: University of Nebraska-Lincoln, Engineering Library	(402) 472-3411
Nevada	Reno: University of Nevada Library	(702) 784-6579
New Hampshire	Durham: University of New Hampshire Library	(603) 862-1777
New Jersey	Newark Public Library	(201) 733-7815
New Mexico	Albuquerque: University of New Mexico Library	(505) 277-5441
New York	Albany: New York State Library	(518) 474-5125
	Buffalo and Erie County Public Library	(716) 856-7525 Ext. 267
	New York Public Library (The Research Libraries)	(212) 930-0850
North Carolina	Raleigh: D. H. Hill Library, N.C. State University	(919) 737-3280
Ohio	Cincinnati & Hamilton County, Public Library of	(513) 369-6936
	Cleveland Public Library	(216) 623-2870
	Columbus: Ohio State University Libraries	(614) 422-6286
	Toledo/Lucas County Public Library	(419) 255-7055 Ext. 212
Oklahoma	Stillwater: Oklahoma State University Library	(405) 624-6546
Pennsylvania	Cambridge Springs: Alliance College Library	(814) 398-2098
	Philadelphia: Franklin Institute Library	(215) 448-1321**
	Pittsburgh: Carnegie Library of Pittsburgh	(412) 622-3138
	University Park: Pattee Library, Pennsylvania State University	(814) 865-4861
Rhode Island	Providence Public Library	(401) 521-7722 Ext. 226
South Carolina	Charleston: Medical University of South Carolina	(803) 792-2372
Tennessee	Memphis & Shelby County Public Library and Information Center	(901) 725-8876
Texas	Austin: McKinney Engineering Library, University of Texas	(512) 471-1610
	Dallas Public Library	(214) 749-4176
	Houston: The Fondren Library, Rice University	(713) 527-8101 Ext. 2587
Washington	Seattle: Engineering Library, University of Washington	(206) 543-0740
Wisconsin	Madison: Kurt F. Wendt Engineering Library, University of Wisconsin	(608) 262-6845
	Milwaukee Public Library	(414) 278-3043

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*Collection organized by subject matter.

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PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner

WILLIAM FELDMAN, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF April 2, 1983

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL CHEMISTRY AND PETROLEUM CHEMISTRY, GROUP 110—D. E. TALBERT, Director ..... Inorganic Compounds; Inorganic Compositions; Organo-Metal and Organo-Metalloid Chemistry; Metallurgy; Metallurgical Apparatus; Metal Stock; Electro Chemistry; Batteries; Hydrocarbons; Mineral Oil Technology; Lubricating Compositions; Gaseous Compositions; Fuel and Igniting Devices.	1-16-81
GENERAL ORGANIC CHEMISTRY, GROUP 120—C. E. VAN HORN, Director ..... Heterocyclic Amides; Alkaloids; Azo; Sulfur; Misc. Esters; Carbohydrates; Herbicides; Poisons; Medicines; Cosmetics; Steroids; Oxo and Oxy; Quinones; Acids; Carboxylic Acid Esters; Acid Anhydrides; Acid Halides.	11-20-81
HIGH POLYMER CHEMISTRY, PLASTICS AND MOLDING, GROUP 140—J. O. THOMAS, JR., Director .... Synthetic Resins; Rubber; Proteins; Macromolecular Carbohydrates; Mixed Synthetic Resin Compositions; Synthetic Resins With Natural Polymers and Resins; Reclaiming; Pore-Forming; Compositions (Part) e.g., Coating; Molding; Ink; Prosthdontics; Adhesive and Abrading Compositions; Molding, Shaping, Treating Process, and Apparatus Therefor; Irradiation (Part); Bleaching; Dyeing; Leather, Fur and Textile Treating Compositions.	3-1-82
COATING, LAMINATING AND PHOTOGRAPHY, GROUP 160—S. N. ZAHARNA, Director ..... Coating: Processes, Apparatus and Misc. Products; Laminating Methods and Apparatus; Stock Materials; Adhesive Bonding; Special Chemical Manufactures; Special Utility Compositions; and Photography.	3-09-82
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 170—R. F. WHITE, Director ..... Fertilizers; Foods; Fermentation; Analytical Chemistry; Reactors; Sugar and Starch; Paper Making; Glass Manufacture; Gas; Heating and Illuminating; Cleaning Processes; Liquid Purification; Distillation; Preserving; Liquid, Gas, and Solid Separation; Gas and Liquid Contact Apparatus; Refrigeration; Concentrative Evaporators; Mineral Oils Apparatus; Misc. Physical Processes.	1-12-82
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—S. W. ENGLE, Director Generation and Utilization; General Applications; Conversion and Distribution; Heating and Related Art Conductors; Switches; Photography; Motion Pictures; Horology; Acoustics; Recorders; Weighing Scales.	5-22-81
SPECIAL LAWS ADMINISTRATION, GROUP 220—KENNETH L. CAGE, Director ..... Ordnance, Firearms and Ammunition; Lubrication; Illumination; Nuclear Reactors; Acoustics, Communications, Optics; Radar; Directional Radio; Torpedoes; Seismic Exploring; Cathode Ray Tube Circuitry; Cryptography; Laser Devices; Radioactive Materials; Powder Metallurgy, Rocket Fuels; Special, Fuel, Explosive and Thermic Compositions; Thermal and Photoelectric Batteries.	3-30-81
INFORMATION TRANSMISSION, STORAGE, AND RETRIEVAL, GROUP 230—EARL LEVY, Director ..... Communications; Multiplexing Techniques; Television; Facsimile; Data Processing, Computation and Conversion; Storage Devices and Related Arts.	1-05-81
RECEPTACLES, CLEANING, WINDING, AND MEASURING, GROUP 240—G. M. FORLENZA, Director ..... Receptacles; Bearings; Joint Packing; Conduits; Switches; Presses; Plumbing Fixtures; Textile Spinning; Cleaning; Food Treating; Agitating; Centrifugal Separating; Geometrical Instruments; Sound Recording; Image Projectors; Web Feeding; Winding and Reeling; Cable Hoists; Measuring and Testing; Indicating; Fluent Material Handling; Shaft; Impellers; Rotary Fluid Motors.	5-12-81
ELECTRONIC COMPONENT SYSTEMS AND DEVICES, GROUP 250—S. S. MATTHEWS, Director ..... Semi-Conductor and Space Discharge Systems and Devices; Electronic Component Circuits; Wave Transmission Lines and Networks; Optics; Radiant Energy; Measuring.	8-25-80
DESIGN, GROUP 290—KENNETH L. CAGE, Director ..... Industrial Arts; Household, Personal and Fine Arts.	1-30-81
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—B. R. GRAY, Director ..... Conveyors; Hoists; Elevators; Article Handling Implements; Store Service; Sheet Feeding; Dispensing; Fluid Sprinkling; Fire Extinguishers; Coin Handling; Check Controlled Apparatus; Classifying and Assorting Solids; Boats; Ships; Aeronautics; Motor and Land Vehicles and Appurtenances; Brakes; Railways and Railway Equipment.	5-18-81
MATERIAL SHAPING, ARTICLE MANUFACTURING, TOOLS, GROUP 320—STEPHEN G. KUNIN, Director Manufacturing Processes, Assembling, Combined Machines, Special Article Making; Metal Deforming; Sheet Metal and Wire Working; Metal Fusion-Bonding, Metal Founding; Machine Tools for Shaping or Dividing; Work and Tool Holders, Woodworking; Tools; Cutlery; Jacks; Fishing, Etc.; Butchering; and Books and Printed Matter.	7-27-81
AMUSEMENT, HUSBANDRY, PERSONAL TREATMENT, INFORMATION, GROUP 330—R. E. AEGERTER, Director ..... Amusement and Exercising Devices; Projectors; Animal and Plant Husbandry; Plants; Harvesting; Earth Working and Excavating; Tobacco; Artificial Body Members; Dentistry; Jewelry; Surgery; Toiletry; Printing; Typewriters; Information Dissemination.	8-27-82
HEAT, POWER, AND FLUID ENGINEERING, GROUP 340—D. J. STOCKING, Director ..... Power Plants; Combustion Engines; Fluid Motors; Reaction Motors; Pumps; Rotary Engines and Pumps; Heat Generation and Exchange; Refrigeration; Ventilation; Drying; Temperature and Humidity Regulation; Couplings; Gearing; Fluid Handling and Control; Lubrication.	11-17-80
GENERAL CONSTRUCTIONS, TEXTILES, MINING AND GEARING, GROUP 350—A. L. SMITH, Director ..... Building Structures; Racks; Cabinets; Closures; Supports; Furniture; Fasteners; Locks; Pipe Couplings; Joints; Miscellaneous Hardware; Textiles; Sewing Machines; Apparel; Footwear; Earth Engineering; Earth Drilling; Mining; Wells; Roads; Bridges; Tool Driving; Gearing; Machine Elements; Clutches.	9-17-80

Expiration of patents: The patents within the range of numbers indicated below expire during April 1983, except those which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents ..... Numbers 3,243,822 to 3,248,737, inclusive

Plant Patents ..... Numbers 2,616 to 2,627 inclusive

REEXAMINATIONS

JANUARY 24, 1984

Matter enclosed in heavy brackets [ ] appears in the patent but forms no part of this reexamination specification; matter printed in italics indicates additions made by reexamination.

B1 4,113,845 (155th)

DISPROPORTIONATION OF CHLOROSILANE

Carl J. Litteral, Newport, Ohio, assignor to Union Carbide Corporation, New York, N.Y.

Reexamination Request No. 90/000,360, Apr. 18, 1983.

Reexamination Certificate for Patent No. 4,113,845, issued Sep. 12, 1978, Ser. No. 724,919, Sep. 20, 1976

Continuation of Ser. No. 152,587, Jun. 14, 1971, abandoned, which is a continuation-in-part of Ser. No. 99,087, Dec. 17, 1970, abandoned.

Int. Cl.[3] **C01B** *33/08, 33/04*

U.S. Cl. 423—342

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims **1–3** is confirmed.

1. The cyclic continuous process for the disporportionation of one or more of trichlorosilane, dichlorosilane and monochlorosilane which comprises continually feeding such chlorosilane to a water-dried fixed bed of a divinylbenzene-styrene copolymer based macroreticulated anion exchange resin containing tertiary amino or quaternary ammonium groups thereof in the chloride ionic form, said groups being bonded to the resin through carbon, which resin is insoluble in silane, monochlorosilane, dichlorosilane, trichlorosilane and silicon tetrachloride, and is maintained at a temperature of between 0.° C. to 350° C. for a period of time whereby there is formed in the bed a silane containing less chlorine than is contained in the chlorosilane fed to the bed and there is also formed a silane containing more chlorine than the chlorosilane fed to the bed, at least a portion of said silanes formed by disproportionation in the bed are removed therefrom and at least a portion thereof are separated each from the other and each is recovered and the chlorosilane feed which is not disproportionated is recycled to the fixed bed.

B1 4,118,413 (156th)

PREPARATION OF PHENOXYBENZYL ESTERS

Derek A. Wood, Sittingbourne, England, assignor to Shell Oil Company, Houston, Tex.

Reexamination Request No. 90/000,233, Jul. 26, 1983.

Reexamination Certificate for Patent No. 4,118,413, issued Oct. 3, 1978, Ser. No. 824,459, Aug. 15, 1977.

Division of Ser. No. 737,312, Nov. 1, 1976, Pat. No. 4,061,664.

Claims priority, application United Kingdom, Nov. 12, 1975, 46700/75

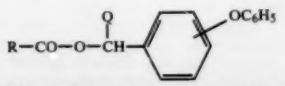
Int. Cl.[3] **C07C** *69/743, 69/76, 121/75*

U.S. Cl. 260—465 D

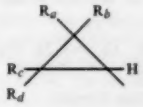
AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claims **1–11**, having been finally determined to be unpatentable, are cancelled.

[1. A process for the preparation of a phenoxybenzyl ester of formula (I)

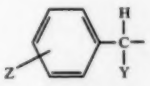


wherein Q is a hydrogen atom or a cyano group and R is a. a cyclopropyl group of the formula

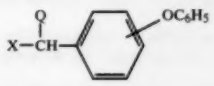


in which R_a and R_b each is an alkyl group containing from 1 to 6 carbon atoms, or a halogen atom having an atomic number of from 9 to 35, inclusive, or when R_a is a hydrogen atom then R_b is an alkenyl group containing from 2 to 6 carbon atoms optionally substituted by from 1 to 3 chlorine or bromine atoms, R_c and R_d each is an alkyl group containing from 1 to 6 carbon atoms, or when R_c is hydrogen then R_d is an alkenyl group having from 2 to 6 carbon atoms optionally substituted by from 1 to 3 chlorine or bromine atoms or either of R_a and R_b or R_c and R_d when taken together is an alkylene group containing from 2 to 6 carbon atoms; or

b. a benzyl group of the formula



in which Z is a halogen atom having an atomic number of from 9 to 35, inclusive, or an alkoxy group containing from 1 to 4 carbon atoms and Y is an alkyl group containing from 1 to 6 carbon atoms, in which process an acid of the formula R—COOH in which R is as defined above is neutralized with a water-soluble base, and then contacted with a solution in a water-immiscible organic solvent of a benzyl halide of formula II



in which X is a halogen atom; and Q is as defined above in the presence of a phase-transfer catalyst comprising a tetrahydrocarbyl ammonium or phosphonium halide in which the hydrocarbyl groups are selected from aromatic, aliphatic, cycloaliphatic or unsaturated groups, said groups together containing a total number of carbon atoms of from 12 to 70.**]**

B1 4,302,465 (157th)

THERAPEUTICALLY ACTIVE, SUBSTITUTED PIPERIDINES AND PYRROLIDINES THERAPEUTIC COMPOSITIONS THEREOF AND METHODS OF USE THEREOF

Bo T. AF Ekenstam, Box 721, Hjälteby, Sweden S-440 74, and Gunnar A. K. Aberg, Utsiktsvägen 7, Falkenberg, Sweden S-311 00

Reexamination Request No. 90/000,281, Oct. 26, 1982.

Reexamination Certificate for Patent No. 4,302,465, issued Nov. 24, 1981, Ser. No. 97,148, Nov. 26, 1979.

Claims priority, application Sweden, Oct. 7, 1979, 7906000

Int. Cl.[3] **A61K** *31/445;* **C07D** *213/56*

U.S. Cl. 424—267

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

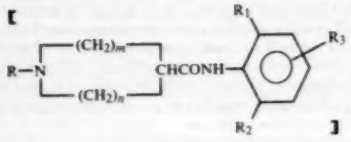
The patentability of claims **5**, **7**, **8** and **11** is confirmed.

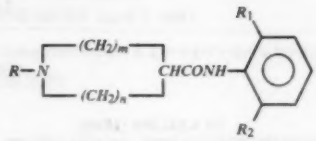
Claims **6**, **9**, **10**, and **12**, having been finally determined to be unpatentable, are cancelled.

Claims **1** and **19–21** are determined to be patentable as amended:

Claims **2–4**, **13–18**, **22**, and **23**, dependent on amended claims, are determined to be patentable.

1. A compound of the formula

[]



in which [m and n are a pair of integers such that m=0 or 1 and n=3−m or] m=0, 1 or 2 and n=4−m, R is straight or branched hydroxyalkyl having 2 to 4 carbons and having the hydroxy group in a terminal position, R_1 is selected from the group consisting of methyl and methoxy[,] *and* R_2 is selected from the group consisting of methyl and ethyl [and R_3 is selected from the group consisting of hydrogen and methyl]; and pharmaceutically acceptable acid addition salts thereof and quaternary N-methyl halides and quaternary N-ethyl halides thereof.

Errata

For Reexamination Certificate B1 3,796,048, issued May 31, 1983, in column 1, line 22, after "claim", insert "5".

REISSUES

JANUARY 24, 1984

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

Re. 31,503
TRACKWAY AND POWERED VEHICLE WITH CHANGEABLE COVERS

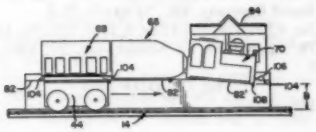
Makoto Saito, Tokyo, Japan, assignor to Tomy Kogyo Co., Inc., Tokyo, Japan

Original No. 4,109,412, dated Aug. 29, 1978, Ser. No. 755,868, Dec. 30, 1976. Application for reissue Jul. 9, 1980, Ser. No. 167,192

Claims priority, application Japan, Jun. 18, 1976, 51/80873

Int. Cl.³ A63H *19/00*

U.S. Cl. 46—216 **15 Claims**



5. An amusement device, comprising:

a trackway including an elongated station having two ends,

a vehicle chassis having wheels for rolling said chassis along said trackway and through said station via the ends thereof,

a plurality of bodies each adapted to be deposited on and removed from said chassis, and

body exchange means for replacing a first body carried by said chassis with a second body previously positioned at said station, said body exchange means including means for removing said first body from said chassis when said chassis enters said station by supporting said first body on said station adjacent the end thereof that said chassis enters, and means for depositing said second body on said chassis when said chassis exits said station by lifting said second body from said station adjacent the end thereof that said chassis exits.

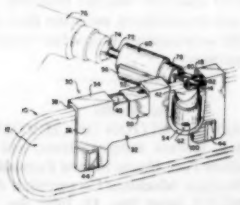
Re. 31,504
SAW CHAIN SHARPENING FIXTURE

Frank J. Aksamit, West Hartford, Conn., assignor to Pro Sharp Corporation, Newington, Conn.

Original No. 4,173,908, dated Nov. 13, 1979, Ser. No. 866,366, Jan. 3, 1978. Application for reissue Jul. 30, 1980, Ser. No. 173,826

Int. Cl.³ B23D *63/16*

U.S. Cl. 76—25 A **12 Claims**



9. In an assembly for sharpening cutting links of a saw chain having the cutting links mounted on a cutter bar and comprising a sharpening tool and a fixture for the sharpening tool, the improvement wherein the fixture comprises a longitudinally extending frame for straddling the cutter bar and a section of chain mounted on the cutter bar, the frame having an inverted generally U-shaped cross section including a web adapted to freely rest on and be supported by the top of the cutting links and spaced confronting sidewalls depending from opposite sides of the web and defining an interior channel, said sidewalls being adapted to flex outwardly during mounting of the cutter bar and section of chain in the channel, the frame having intermediate its ends an opening formed in the web and sidewalls for communicating with the interior channel, a pair of adaptor guides mounted on the frame below its web and diverging outwardly from said opening, the guide being positioned in fixed nonadjusting relationship to said web and sidewalls, each guide having an elongated bearing surface of semi-circular cross section with its lowermost portion below the top of the cutter bar, and an adaptor dimensioned and configured to be seated on and supported by the semi-circular bearing surface of a selected one of the guides, the adaptor being provided with a central aperture for supporting and aligning the sharpening tool for movement along an axis disposed below the web of the frame in spaced apart relation to the bearing surfaces of the guides for sharpening a cutting link positioned within said web opening.

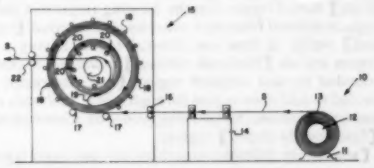
Re. 31,505
COIL DEPLETION SENSOR

Walter J. Hood, Shaker Heights, and George Gulden, Jr., Lyndhurst, both of Ohio, assignors to Kent Corporation, Cleveland, Ohio

Original No. 4,163,527, dated Aug. 7, 1979, Ser. No. 932,272, Aug. 9, 1978. Application for reissue Jul. 16, 1982, Ser. No. 398,931

Int. Cl.³ B65H *17/48;* **B21C** *47/16*

U.S. Cl. 242—55 **14 Claims**



1. In combination, an uncoiler which carries a revolvable coil of strip material, an accumulator having revolving pinch rolls which draw strip material from the coil on said uncoiler, said accumulator at least temporarily storing a quantity of the strip material while transferring strip material to a processing line, and a control device, said control device comprising first means providing a signal proportional to the revolutions of said pinch rolls, second means providing a signal proportional to the revolutions of the coil, counter means having at least one predetermined number loaded therein and counting the occurrence of each signal from said first means, and means to reset said counter means to a said predetermined number if a signal from said second means is received by said means to reset [before] *after* said counter means has counted a number equal to said predetermined number.

Re. 31,506

METHOD OF MANUFACTURING OXIDE ISOLATED SEMICONDUCTOR DEVICE UTILIZING SELECTIVE ETCHING TECHNIQUE

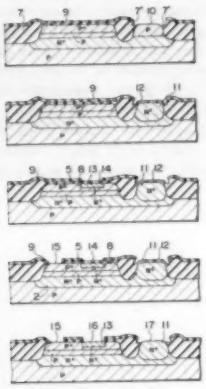
Katumi Ogiue; Hiroyuki Kondo, both of Hinode; Takashi Ishikawa, Fuchu; Takaaki Mori, Ome, and Takahisa Nitta, Fuchu, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Original No. 4,111,724, dated Sep. 5, 1978, Ser. No. 750,387, Dec. 14, 1976. Application for reissue Sep. 2, 1980, Ser. No. 183,100

Claims priority, application Japan, Dec. 22, 1975, 50-151828

Int. Cl.³ H01L *21/76, 21/306*

U.S. Cl. 148—175 **6 Claims**



5. A method of manufacturing a semiconductor integrated circuit device comprising the *succeeding* steps of:

(a) selectively forming a first heavily doped region of a first conductivity type in the surface portion of a semiconductor substrate of a second conductivity type;

(b) growing an epitaxial layer of said second conductivity type on the surface of said substrate and thereby burying said first heavily doped region;

(c) selectively etching away said epitaxial layer to form *a* recessed [portions] *portion* and selectively oxidizing said epitaxial layer in said recessed [portions] *portion* to form *an* oxidized [regions] *region* extending to the [substrate] *buried region*, thereby forming respective element regions isolated from each other by said oxidized [regions and] *region*, at least one element region having a main region and an [electrode contact] *additional* region surrounded by said oxidized region [and electrically connected to said main region through said], *said main region and said additional region being formed on a common* buried [first heavily doped] region;

(d) [selectively diffusing impurities into said main region to form a second semiconductor region of said second conductivity type and a third semiconductor region of said first conductivity type and into said electrode contact region to convert the conductivity type and form an electrode contact region of said first conductivity type extending to said buried region and forming simultaneously oxide films on exposed surfaces,] *diffusing an impurity into said main region to form a second semiconductor region of said second conductivity type and forming simultaneously an oxide film thereon;*

(e) diffusing an impurity into said additional region to form an electrode contact region of said first conductivity type extending to said buried region and forming simultaneously an oxide film thereon;

(f) selectively diffusing an impurity into said second region to form a third semiconductor region of said first conductivity type and forming simultaneously an oxide film thereon, said third semiconductor region and said electrode contact region being covered with oxide films of smaller thickness than [those] *that* of [other portions] *the axide film on said second region;*

[(e)] *(g)* opening a window in said oxide film on said second semiconductor region;

[(f)] *(h)* uniformly etching away the oxide [film] *films* to a predetermined depth so that [said thin oxide films on] *the surfaces of* said third semiconductor region and said electrode contact region are exosed [;] *;* and

[(g)] *(i)* forming metal electrodes on the exposed semiconductor [surface] *surfaces* and on [the remaining oxide film] *said oxidized region.*

Re. 31,507

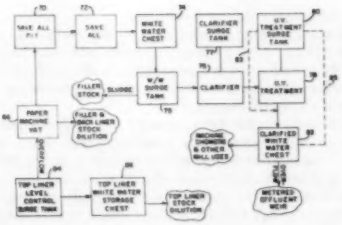
METHOD OF TREATING PAPERMAKING WHITE WATER

Arthur W. Frost, III, Park Ridge, N.J., assignor to Federal Paper Board Company, Inc., Montvale, N.J.

Original No. 4,221,634, dated Sep. 9, 1980, Ser. No. 13,088, Feb. 21, 1979. Application for reissue Aug. 31, 1981, Ser. No. 297,775

Int. Cl.³ D21F *1/66*

U.S. Cl. 162—190 **5 Claims**



1. An improved method of papermaking, said method comprising dispersing papermaking fibers in a slurry, depositing said fibers from said slurry on a papermaking apparatus which includes fiber laying means and a white water recovery system, recovering the white water from said papermaking machine and elsewhere in the papermaking process, clarifying said white water after recovery thereof from said papermaking apparatus, and thereafter at least intermittently exposing said clarified white water to ultraviolet light of sufficient wavelength and quantity to initiate polymerization of dissolved solid materials contained in said papermaking white water into more complex, less soluble molecular structure, permitting said polymerization to continue until said substantial portions of said dissolved solid materials become insoluble, and periodically removing said insolubilized materials from said clarified white water while recirculating said white water within said papermaking apparatus.

Re. 31,508

ELECTRODEPOSITION OF CHROMIUM

Donald J. Barclay, Olivers Battery Hants, and William M. Morgan, Chandlers Ford Hants, both of England, assignors to International Business Machines Corporation, Armonk, N.Y.

Original No. 4,062,737, dated Dec. 13, 1977, Ser. No. 637,483, Dec. 3, 1975. Continuation of Ser. No. 97,572, Nov. 26, 1979, abandoned. Application for reissue Apr. 26, 1982, Ser. No. 371,918

Claims priority, application United Kingdom, Dec. 11, 1974, 53642/74

Int. Cl.³ C25D *3/06, 3/56*

U.S. Cl. 204—43 R **20 Claims**

1. A composition of matter for use in the electrodeposition of *bright* chromium containing deposits consisting essentially of

an aqueous solution of aquo chromium (III) thiocyanato [complex] *complexes* as a source of trivalent chromium, the concentration of [the] Cr (III) *in the solution* being in the range of 0.03 to 0.5 M, *and the thiocyanate concentration in the solution being in the range of 0.05 to 1.0 M, wherein the concentration of thiocyanate is higher than the concentration of Cr (III), and wherein the aquo chromium (III) thiocyanato complexes are an equilibrium mixture of complexes of the formula*

$$(H_2O)_{6-n}Cr(SCN)_n^{(+3-n)}$$

where n is a range of whole numbers from 1 through 6.

4. The composition of matter of claim 1 *or 26* for plating cobalt-chromium containing alloys in which cobalt cations are present in said aqueous plating solution.

5. The composition of matter of claim 1 *or 26* for plating nickel-chromium containing alloys in which nickel cations are present in said aqueous plating solution.

Re. 31,509

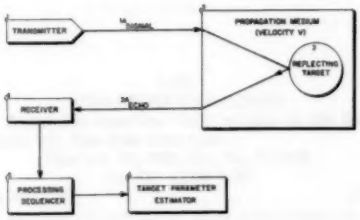
ECHO LOCATION SYSTEMS

Norman S. Neidell, 908 Town and Country Blvd., Suite 420, Houston, Tex. 77024

Original No. 4,114,153, dated Sep. 12, 1978, Ser. No. 691,674, Jun. 1, 1976. Continuation of Ser. No. 483,202, Jun. 26, 1974, abandoned. Application for reissue Sep. 2, 1980, Ser. No. 183,396

Int. Cl.³ G01S *13/58*

U.S. Cl. 343—9 R **46 Claims**



34. A system for determining the velocity of a signal reflecting object positioned in a medium of known signal-propagation characteristics comprising:

(a) signal transmitter means for transmitting at two distinct instants of time at least two signals having a predetermined time interval therebetween, each signal having a continuous amplitude spectrum between low and high frequency limits, for reflection of the signals by the object;

(b) signal receiver means for receiving the reflected signals;

(c) processing sequencer means for measuring only the time interval between the received signals; and

(d) parameter estimator means for determining the relative velocity of the object based only upon the measured time interval between the received signals and the predetermined time interval between the transmitted signals.

Re. 31,510

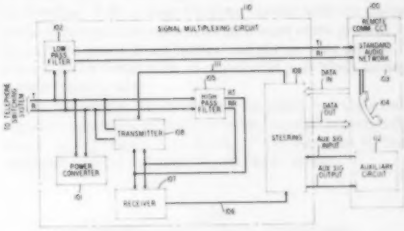
SIGNAL MULTIPLEXING CIRCUIT

Robert L. Carbrey, Boulder, Colo., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Original No. 4,178,480, dated Dec. 11, 1979, Ser. No. 926,422, Jul. 20, 1978. Application for reissue Dec. 8, 1981, Ser. No. 328,745

Int. Cl.³ H04J *3/00*

U.S. Cl. 370—50 **28 Claims**



17. A signal multiplexing circuit for concurrently transmitting a plurality of signals on a communication path comprising:

isolation means responsive to said plurality of signals for separating a first subset of said plurality of signals from the remainder of said plurality of signals in frequency and a second subset of said plurality of signals from the remainder of said plurality of signals in time;

transmitting means responsive to said isolation means for concurrently transmitting two or more of said signals at a time on to said communication path.

PLANT PATENTS

GRANTED JANUARY 24, 1984

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

5,180

MINIATURE ROSE PLANT—MEIFINARO VARIETY

Marie L. Meilland, Antibes, France, assignor to The Conard-Pyle Company, West Grove, Pa.

Filed Jun. 25, 1982, Ser. No. 392,257
Claims priority, application France, Jul. 1, 1981, 3132
Int. Cl.³ A01H *5/00*
U.S. Cl. Plt.—9 **1 Claim**

1. A new and distinct variety of Miniature rose plant, substantially as herein shown and described, characterized particularly by (a) a compact and vigorous growth habit, (b) bronzed green adult wood, and (c) the abundant and continuous formation of attractive well formed very double blossoms which are neyron pink in coloration.

5,181

MINIATURE CARNATION

Angelo J. Siri, San Francisco, Calif., assignor to Siri Brothers Nursery, Inc., East Palo Alto, Calif.

Filed Jul. 12, 1982, Ser. No. 397,555
Int. Cl.³ A01H *5/00*
U.S. Cl. Plt.—70 **1 Claim**

1. A new and distinct variety of miniature carnation plant, substantially as herein shown and described.

5,182

MINIATURE ROSE PLANT-WHITE CHIPPER VARIETY

Ezequiel Collazo, West Grove, Pa., assignor to The Conard-Pyle Company, West Grove, Pa.

Filed Jun. 30, 1982, Ser. No. 393,864
Int. Cl.³ A01H *5/00*
U.S. Cl. Plt.—8 **1 Claim**

1. A new and distinct variety of Miniature rose plant, substantially as illustrated and described, wherein:

(a) from the physical standpoint the plant is substantially identical to that of the parent Chipper variety with the exception of the blossom coloration, has an almost erect growth habit, forms light green shiny leaves, and forms very double flowers which are white with an occasional pink blush during the cooler months; and

(b) from the biological standpoint the plant has vigorous and regular vegetation, exhibits an abundant and repeated florescence, and possesses the ability of its blossoms to last for extended periods whether on the bush or cut.

5,183

LIQUIDAMBAR TREE, FREMONT

Frank J. Serpa, 715 Seville Pl., Fremont, Calif. 94539

Filed Jul. 1, 1982, Ser. No. 394,397
Int. Cl.³ A01H *5/12*
U.S. Cl. Plt.—51 **1 Claim**

1. The new and distinct variety of liquidambar tree described, illustrated and identified by the characteristics enumerated above.

PATENTS

GRANTED JAN. 24, 1984

ERRATA

For CLASS	See PATENT NO.
254–001	4,427,178
428–195	4,427,356
436–057	4,427,415
502–111	4,427,573
502–154	4,427,574
502–208	4,427,575
502–218	4,427,576
502–066	4,427,577
502–177	4,427,578
381–094	4,427,845

PATENTS

GRANTED JANUARY 24, 1984

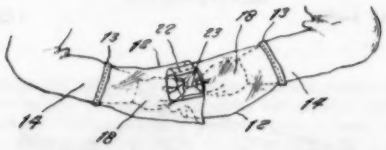
GENERAL AND MECHANICAL

4,426,739

BAITING SLEEVES FOR ICE FISHING

Gary J. Wadsworth, 779 Wallace St., Wallaceburg, Ontario,, Canada N8A 1L3

Filed Oct. 16, 1981, Ser. No. 312,296
Int. Cl.³ A41D *13/08*
U.S. Cl. 2—16 **1 Claim**



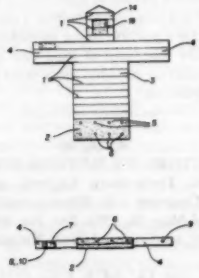
1. A pair of baiting sleeves for ice fishing, having an observation window comprising: in combination, two separate sleeve extenders, each one of which is comprised of a length of tubing made from a transparent flexible plastic material; means at one end of said tubing for removable securement around a sleeve or sleeve cuff of a coat while said tubing extends therefrom and fully encloses lengthwise a user's hand extending outwardly of said sleeve or said sleeve cuff; said means comprising an elastic tape sewn around an end edge of said edge of said tubing; and an inner side of said tubing being made with a fleece material for purpose of warmth, said fleece material being left off a small area of said tubing in a vicinity of the fingers of the user's hand so that said area forms an observation window, whereby the user may observe his fingers during a baiting procedure while still having the comfort of insulating his hands from the cold exterior environment.

4,426,740

WATER-PROOF GARMENT HORIZONTALLY FOLDABLE

Leo Reverberi, 5, passage de la Main d'Or, Paris XI^e, France 75011

Filed Nov. 10, 1980, Ser. No. 208,235
Claims priority, application France, Nov. 16, 1979, 79 28384; Aug. 20, 1980, 80 18172
Int. Cl.³ A41D *3/08*
U.S. Cl. 2—84 **12 Claims**



1. A water-proof garment forming a body portion and arm sleeves made of a back part and of a front part which can be laid flat one against the other with the arm sleeves extended and flat, said body portion defining a longitudinal vertical central axis with the arm sleeves transverse to said axis, said front and back part being provided with a plurality of equally-spaced permanently-set fold-lines extending at right angles to said longitudinal axis and extending along the entire length of said arm sleeves as well as along said body part, said fold-lines allowing said garment to be folded in accordion-like fashion about said fold-lines and substantially along the longitudinal axis of said sleeves to form superposed pleats, a marginal portion depending from the lower edge of one of said front and back parts wider than said pleats and foldable around the folded body portion and fastener means to releasably maintain said marginal portion in folded position, and further separable fastener means on said garment along said longitudinal axis of said sleeves so arranged that the folded garment can be worn around the wearer's waist in a band-like member.

4,426,741

INTRAOCULAR LENS WITH ROTATABLE APPENDAGE

Timothy Bittner, Duarte, Calif., assignor to Ioptex Inc., Azusa, Calif.

Filed Apr. 8, 1982, Ser. No. 366,583
Int. Cl.³ A61F *1/16, 1/24*
U.S. Cl. 3—13 **20 Claims**

1. An intraocular lens comprising:
a. an optional portion;
b. at least one appendage connected to said optical portion, said appendage including a first portion, a second portion connected to said first portion, and a third portion linked to said optical portion and said second portion; and
c. means for permitting rotation in one direction of said first portion of said at least one appendage in relation to said optical portion upon the application of an actuating force upon said second portion of said at least one appendage, and rotation in the opposite direction upon removal of said actuating force.

4,426,742

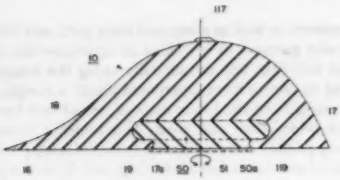
BREAST PROSTHESIS

Jan Prahl, Ruilstorf, Fed. Rep. of Germany, assignor to Beiersdorf Aktiengesellschaft, Hamburg, Fed. Rep. of Germany

Filed Dec. 1, 1981, Ser. No. 326,272
Claims priority, application Fed. Rep. of Germany, Dec. 12, 1980, 3046784; Dec. 12, 1980, 3046785; Dec. 12, 1980, 3046786
Int. Cl.³ A41C *3/10*; A61F *1/00*
U.S. Cl. 3—36 **12 Claims**

1. Breast prosthesis of an elastic plastic, in particular of the silicone rubber composition, having a breast molding corresponding to the female breast and having a bearing surface adapted to conform to the human body form, and on which an adhesive is applied for attachment of the breast prosthesis to the body, characterized in that the upper portion of the breast molding is in the form of a cup having an approximately centered recess in the direction of the body, in combination with an adapter type molding retained in said recess, said cup being

rotatable about said molding on its vertical median axis, and in which the external wall area of said molding, turned toward



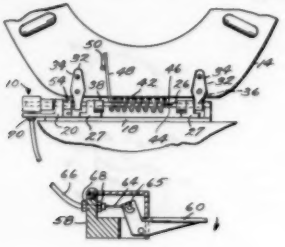
the body, is provided with a coating of an adhesive composition tolerated by the skin.

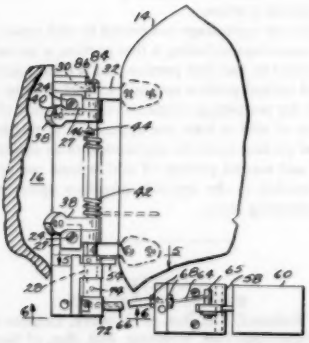
4,426,743

TOILET SEAT LIFTING DEVICE

Allan B. Seabrooke, Bradenton, Fla., assignor to Sani-Seat, Incorporated, Bradenton, Fla.

Filed Aug. 24, 1982, Ser. No. 410,996
Int. Cl.³ A47K *13/10*
U.S. Cl. 4—251 **9 Claims**





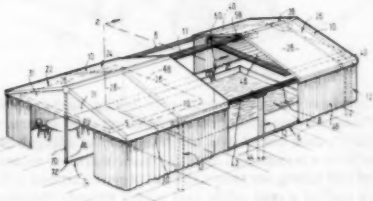
1. A toilet seat assembly comprising a toilet seat mounted at its rear edge for free swinging movement about a horizontal axis between a horizontal position and a raised position; bias means cooperating with said seat in a manner to apply thereto in its horizontal, raised and intermediate positions an upward resilient bias force, said seat by virtue of its weight applying a downward force against said bias force in the horizontal, raised and intermediate positions of said seat, the weight of said seat being sufficient to overcome said bias force whereby said seat normally assumes a horizontal position; and operator-controlled means for selectively applying additional resilient upward bias force to said seat and for removing said additional force from said seat, said additional resilient bias force when applied being sufficient to swing said seat to its raised position, said seat thereby being held in its raised position solely by resilient upward bias forces whereby downward forces resulting from forcible manual lowering of said seat are absorbed by the bias means.

4,426,744

COMBINATION OF AN OUTDOOR SWIMMING POOL AND ADJUSTABLE ROOF STRUCTURE

William Love, Silverstone, Uffmor La., Halesowen, Midlands, England

Filed Feb. 2, 1979, Ser. No. 9,833
Int. Cl.³ E04H *3/19*
U.S. Cl. 4—503 **1 Claim**



1. An outdoor swimming pool having a roof structure extending over the pool and over a patio laterally adjacent to the pool, the roof structure being mounted for vertical movement by power operated means between a lowered position, in which it prevents access to the pool, and a raised position in which access to the pool is permitted, securing means being provided along a line extending around the periphery of the pool and adjacent patio, with curtains extending from the roof structure to said securing means, which curtains may be drawn around a selected side or sides of the pool and adjacent patio;

a plurality of thermal insulating members;

the roof structure supporting said insulating members which, when the roof structure is in its lowered position are seated on and extend between the peripheral margins bounding the pool;

the insulating members being so mounted on the roof structure that on movement of the roof structure to its lowered position, lowering movement of the insulating members takes place relative to the roof structure itself;

a portion of said roof structure being separate from the thus-defined remainder of said roof structure; said roof structure portion having at least one of said curtains and at least one of said insulating members associated therewith;

said roof structure portion being mounted for lateral movement together with said at least one curtain and said at least one insulating member associated therewith when in said raised position.

4,426,745

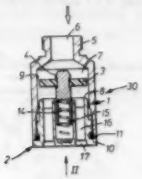
ABLUTIONARY SHOWER SYSTEMS

Nicholas J. Beck, Tewkesbury, England, assignor to Walker Crosweller & Company Ltd., Gloucestershire, England

Filed May 20, 1982, Ser. No. 380,396
Claims priority, application United Kingdom, Jun. 13, 1981, 8118272
Int. Cl.³ A47K *3/22, 3/23*
U.S. Cl. 4—597 **8 Claims**

1. In a shower system for ablutionary use having a water supply pipe leading to a shower head, a drain valve is fitted to communicate with the lowest point of said water supply pipe, said drain valve comprises a hollow body having a drain outlet and an inlet chamber opposed to said drain outlet with the inlet chamber in communication with said water supply pipe, a clack valve mounted in said inlet chamber for movement relative to a valve seat, an outlet port adjacent said valve seat and

opening to said drain outlet, spring means acting on said clack valve to bias it into a first position disposed away from said valve seat and opening said outlet port, a restricted clearance between said clack valve and the wall of said inlet chamber permitting water in said chamber to seep past said clack valve



through said port to said drain outlet when the pressure in said inlet chember is less than the spring bias pressure, and said clack valve being movable to a second position closing on said valve seat when the pressure in said inlet chamber and said water supply pipe overcomes said spring bias pressure.

4,426,746

METHOD AND DEVICE FOR SEALING A HIGH PRESSURE STEAMER

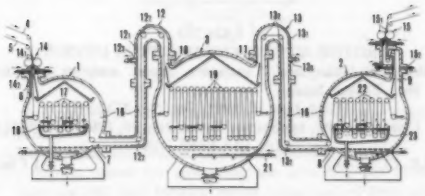
Yoshikazu Sando; Susumu Niwa, and Hiroshi Ishidoshiro, all of Wakayama, Japan, assignors to Sando Iron Works Co., Ltd., Wakayama, Japan

Filed Jul. 21, 1981, Ser. No. 285,458

Claims priority, application Japan, Jul. 30, 1980, 55-104647; Jul. 30, 1980, 55-104648

Int. Cl.³ D06B *23/18*

U.S. Cl. 8—149.3 **7 Claims**



1. A method of sealing a high pressure steamer for the continuous wet heat treatment of a cloth, comprising a steamer body having an inlet and an outlet, a first gas body having an inlet and an outlet, a second gas body having an inlet and an outlet, a first cloth passage connects the outlet of said first gas body to the inlet of said steamer body, a second cloth passage connects the inlet to said second gas body to the outlet of said steamer body, a seal mechanism connected to the inlet to said first gas body and another seal mechanism connected to the outlet from said second gas body, each said seal mechanism comprising a pair of seal rubber rolls, wherein the method comprises the steps of passing a cloth through the seal mechanism into said first gas body and then successively through the first cloth passage, the steamer body, the second cloth passage, the second gas body and out of the another seal mechanism from the second gas body, providing steam at an elevated temperature and pressure within said steamer body, filling a gas having a density heavier than air and a pressure the same as the steam in the steamer body into or at least the first and second cloth passages for preventing the leakage of the high temperature and high pressure steam from the steamer body through the first and second gas bodies to the seal mechanisms.

4,426,747

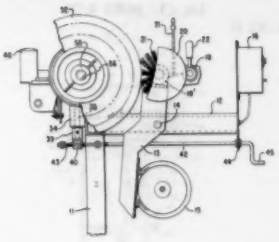
WHEEL RIM BUFFER

Clark M. Mola, 500 E. 21st St., Yankton, S. Dak. 57078; Maurice L. Evans, 1401 Peninah, Yankton, S. Dak. 57078, and Richard D. Beringer, 417 N. Pearl, Tyndall, S. Dak. 57066

Filed Jan. 11, 1982, Ser. No. 338,548

Int. Cl.³ A46B *13/02*

U.S. Cl. 15—21 D **8 Claims**



1. A device for cleaning the rim of a wheel comprising a stand including longitudinal support means, motor driven buffer means mounted on said support means for slidable lateral motion relative to said support means and for longitudinal motion along said support means, wheel support means including shaft means for holding the wheel and drive means drivingly engaged with said shaft means and adapted to rotate said wheel adjacent said buffer means, said wheel support means being pivotally mounted on said stand whereby said wheel support means, including said shaft means, may be pivoted on an axis substantially perpendicular to the axis of said shaft means.

4,426,748

MOTORCYCLE FOR CLEANING THE GROUND

Jean-Francois Decaux, 88 bld. M. Barres, 92200 Neuilly, France

Filed Mar. 25, 1981, Ser. No. 247,370

Int. Cl.³ E01H *1/04*

U.S. Cl. 15—83 **18 Claims**

1. A motorcycle for picking up rubbish or the like of small volume, such as excrements of dogs, said motorcycle comprising a frame, footrest means mounted on the frame for the motorcyclist for conventional use of the motorcycle, support means mounted on the frame, at least one unit movably mounted on the support on a given lateral side of the frame and comprising a case, means defining a pedal surface, cleaning means which are located in the case and have an exposed part for cleaning contact with the ground for effecting said picking up, said unit being movable between a cleaning position in which the cleaning means are in contact with the ground and a withdrawn position in which the cleaning means are spaced from the ground, transmission means, connecting the cleaning means to a motor so that the motor can drive the cleaning means, the pedal surface being located in the immediate vicinity of the footrest means in said withdrawn position of the unit

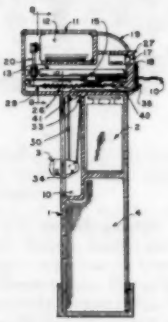
whereby the motorcyclist can move the unit to said cleaning position by moving his foot from the footrest means to the pedal surface and depressing the pedal surface.

4,426,749

TORCH TIP BORE CLEANING TOOL

Howard W. Long, 3436 Upland Dr., Anchorage, Ak. 99504

Filed Dec. 21, 1981, Ser. No. 333,067
Int. Cl.[3] B08B 9/00
U.S. Cl. 15—93 R 4 Claims



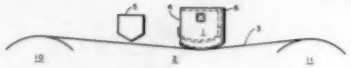
1. Apparatus for cleaning the orifices of torch tips comprising a cylindrical helix of wire, the pitch of which helix is sufficiently small that the helix will exert a pressure against the inside wall of one of said orifices when inserted thereinto and the pitch of which helix is sufficiently great that the helix may be led into one of said orifices having a diameter less than the outside diameter of the helix by a rotation of the helix in a direction which is in the direction of the twist of the helix thus winding the helix sufficiently to reduce the diameter of the helix to that of the orifice, and powered means operably connected to said helix for such rotation.

4,426,750

COMBINED REWIND FOOT/TAPE CLEANER

Robert M. Ariniello, Boulder, and Stuart W. Bray, Louisville, both of Colo., assignors to Storage Technology Corporation, Louisville, Colo.

Filed Aug. 9, 1982, Ser. No. 406,689
Int. Cl.[3] B08B 5/04; A47L 5/38
U.S. Cl. 15—308 9 Claims



7. An improved tape transport system having a read/write head, a plurality of tape guide bearings, a tape cleaning means and a rewind foot, wherein the improvement comprises:

a means for loosening the foreign matter on the surface of the magnetic tape as the tape moves past said means during the read/write operation;

a means for lifting the tape away from the read/write head and the foreign matter removing means during rewind operation, said lifting means rotatably mounted around the foreign matter removing means;

a means for selectively rotating the lifting means into and out of the tape path; and

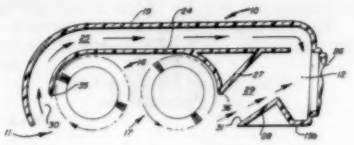
a means for removing the loosened particles from the tape transport system, such that the distance between the read/write head and the tape guides is reduced thereby improving the alignment of the tape as it passes over the read/write head.

4,426,751

VACUUM CLEANER NOZZLE WITH DOUBLE BRUSH

Erwin E. Nordeen, St. Paul, Minn., assignor to Whirlpool Corporation, Benton Harbor, Mich.

Filed Jan. 21, 1982, Ser. No. 341,581
Int. Cl.[3] A47L 5/30
U.S. Cl. 15—384 23 Claims



18. In a vacuum cleaner having a wheeled nozzle defining a front suction inlet, and a suction passage, and means for providing a suction to said passage, the improvement comprising:

a first brush rotatably mounted to said nozzle at said suction inlet;

wall means on said nozzle defining a first transfer passage extending from said suction inlet adjacent said first brush to said suction passage;

a second brush rotatably mounted to said nozzle at said suction inlet;

wall means on said nozzle defining a second transfer passage extending from said suction inlet adjacent said second brush to said suction passage;

means for rotating said first brush to sweep brushed material into said first transfer passage;

means for rotating said second brush to sweep brushed material into said second transfer passage; and

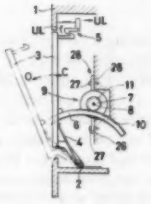
means for stripping from the brushes material clinging to the periphery thereof at the entrance to the respective transfer passages, said entrance to the transfer passages being open downwardly from the stripping means to said suction inlet.

4,426,752

ROTOR MOVEMENT DAMPING DEVICE

Hiromichi Nakayama, Yokohama, Japan, assignor to Nifco, Inc., Tokyo, Japan

Filed Jun. 15, 1981, Ser. No. 273,835
Claims priority, application Japan, Jun. 16, 1980, 55-82888[U]
Int. Cl.[3] E05F 5/02
U.S. Cl. 16—82 1 Claim



1. A rotary oil-damping device comprising:

a shaft having at a forward end thereof a rotor;

a radially extended damper portion provided on at least one part of said shaft;

a radially extended sucker-shaped flange provided on said shaft at a position close to the opening of a space in which said shaft is borne, said flange having a surface sloping axially toward said forward end;

a plastic housing in which said shaft is rotatably supported, said housing being provided with spaces to accommodate said radially extended damper portion and said sucker-shaped flange;

damping oil provided in said accommodating spaces together with said damper portion and said sucker-shaped flange; whereby the rim of said sucker-shaped flange is kept in pressed contact with the front wall of said accommodating space; and means on the opposite end of said shaft from said rotor cooperating with said housing for centering said shaft relative to said housing.

4,426,753

APPARATUS FOR OPENING AND CLEANING COTTON WASTE

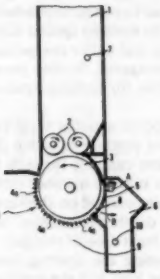
Walter Oellers, Monchen-Gladbach, Fed. Rep. of Germany, and Friederich Fischer, Ubach over Worms, Netherlands, assignors to Trützschler GmbH & Co. KG, Monchen-Gladbach, Fed. Rep. of Germany

Filed Jan. 27, 1982, Ser. No. 343,292

Claims priority, application Fed. Rep. of Germany, Aug. 22, 1981, 8124640[U]

Int. Cl.³ D01G *9/10*

U.S. Cl. 19—83 **12 Claims**



1. An apparatus for opening and cleaning cotton waste, comprising

(a) an opening roll rotated in a direction of rotation;

(b) feeding means for advancing the cotton waste to the opening roll; said feeding means being spaced from said opening roll; and

(c) a housing closely surrounding said opening roll along a substantial part of the circumferential surface thereof, whereby a narrow annular space between said opening roll and said housing is defined; said housing including

(1) a screen disposed arcuately about one part of said circumferential surface and having a first end at a location downstream of said feeding means as viewed in said direction of rotation and a second end being downstream of said first end; said screen having, from said first end to said second end, a gradually increasing distance from said opening roll in a direction coinciding with said direction of rotation; and

(2) a shroud disposed along one part of said circumferential surface and being located downstream of said second end of said screen as viewed in said direction of rotation; said shroud being movably supported for assuming an open position in which cotton material may pass from said narrow annular space to an outlet and a closed position in which passage of the cotton material from said narrow annular space is prevented; said screen forming, at said second end, a smooth transition into said shroud when said shroud is in said closed position.

4,426,754

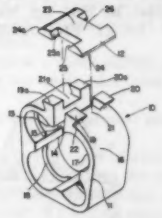
CLAMP FOR MULTIPLE ELECTRICAL CABLES

David W. Smith, Alexandria, Va., and Francis M. Gagnon, Waldorf, Md., assignors to Caci, Inc. - Federal, Arlington, Va.

Filed Nov. 24, 1981, Ser. No. 324,539

Int. Cl.³ F16L *3/00*; B65D *63/00*

U.S. Cl. 24—17 AP **8 Claims**



1. A clamp for multiple electrical cables and the like comprising a band of hard but resilient material shaped to enclose a plurality of cables, and having ends spaced to define a gap therebetween sufficient to receive said electrical cables therethrough such that said ends are adapted to be drawn together, aligned lateral flange means on each of said band ends, the undersides of said flange means being beveled, the length of a said flange means being less than the width of said band in its axial direction so as to define at least one space on a band end adjoining a said lateral flange means, each band end having at least one said space thereon and the spaces on said band ends being aligned, and a locking member having a body portion seatable in said aligned spaces and having a transverse shaped portion at each end thereof with a beveled innerface to conform to said flange means bevels receivable under said flange means when said band ends are drawn together to secure said clamp around cables enclosed therein, said locking member body portion having such a length that when said locking member transverse portion innerfaces are disposed under said flange means undersides said gap is reduced to a distance substantially equal to the horizontal distance under a said beveled underside of said flange means.

4,426,755

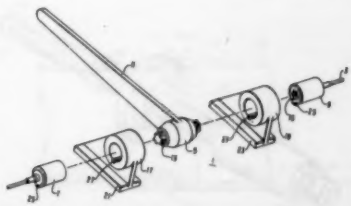
QUICK RELEASE GIRTH BAND

Frank M. Figone, San Bruno, Calif., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Aug. 5, 1981, Ser. No. 290,470

Int. Cl.³ B65D *63/10*

U.S. Cl. 24—28 **7 Claims**



1. A quick release mechanism for a girth band comprising a girth band, a plurality of coupling portions, said girth band having one of said coupling portions connected to each thereof, an arm cooperatively associated with at least one of said coupling portions, said coupling portions being engaged in a latched relationship when said arm is in one position and said couplings being disengagable when said arm is in another

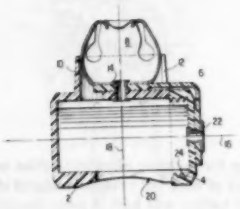
position, means for tensioning said girth band and said engagement being such that the tensioned girth band tends to cause said arm to move away from the position wherein the coupling portions are latched.

4,426,756

SHOELACE KNOT RETAINER

Charles W. Herdman, 1253 Stirling Rd., Dania, Fla. 33004

Filed Mar. 26, 1982, Ser. No. 362,505
Int. Cl.³ F16G *11/00*
U.S. Cl. 24—119 9 Claims



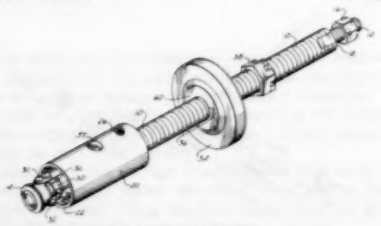
1. A shoelace knot retainer comprising:
(a) knot retaining means having a generally cylindrical wall, with a cylindrical axis, closed at one end and open at an opposite end,
(b) sound-generation means mounted on said generally cylindrical wall, and
(c) protective means comprising a shoulder extending outwardly from said wall in a direction transverse to said axis and at least partially surrounding said sound-generation means in a plane transverse to said direction,
(d) whereby said protective means protects said sound-generation means from being accidentally detached from said cylindrical wall.

4,426,757

WEB GUIDE ROLLER FOR USE AT HIGH SPEEDS AND PROCESS FOR PRODUCING THE SAME

Roland Hourticolon, Leichlingen; Gerhard Roth; Hans Frenken, both of Odenthal; Helmut Schäffer, Leverkusen, and Günther Koepke, Odenthal, all of Fed. Rep. of Germany, assignors to Agfa-Gevaert Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Aug. 6, 1981, Ser. No. 290,738
Claims priority, application Fed. Rep. of Germany, Aug. 16, 1980, 3030917
Int. Cl.³ B21B *27/02*
U.S. Cl. 29—121.8 6 Claims



2. A web guide for a fast moving web comprising
a metal cylindrical member which has been surface sand-blasted and then chrome-plated and the chrome-plated surface has been ground and polished,
a finely branched network of compression chambers and troughs with adjacent plateau-like areas on the member surface to produce a web-supporting circumference of the guide with depressions that can take up a volume of air, and said network consisting of 60 to 70% of the member circumference.

4,426,758

SEAL PULLER

John H. Castoe, 10234 McVine St., Sunland, Calif. 91040

Filed Aug. 23, 1982, Ser. No. 410,308
Int. Cl.³ B23P *19/04*
U.S. Cl. 29—265 10 Claims

1. A seal puller for pulling an annular seal from the interior of a cylindrical housing, the seal having annular front and rear faces and a central opening, and wherein the seal is seated internally within the housing spaced from an exterior end wall of the housing, the seal puller comprising:
a plurality of elongated, flexible jaws having radially protruding portions for locking against the rear face of the seal;
an elongated support member supporting the jaws in a normally retracted position in which the jaws and their protruding portions can pass through the central opening in the seal as the support member extends into the housing;
depth guide means carried on the support member adjacent the jaws, the depth guide means having an end wall for engaging the front face of the seal;
means for adjusting the spacing between the protruding portions of the jaws and the end wall of the depth guide means to match the distance between the front and rear faces of the seal;
means for moving the jaws from their retracted position to an expanded position in which the protruding portions of the jaws engage the rear face of the seal;
a pressure plate carried on the support member and spaced from the depth guide means on a side thereof opposite the protruding portions of the jaws, the pressure plate having a bearing surface for engaging the exterior end wall of the housing; and
means for tightening the bearing surface of the pressure plate against the exterior end wall of the housing to shorten the length of the support member in the housing for causing the protruding portions of the jaws to apply apply pressure to the rear face of the seal for pulling the seal from the housing.

4,426,759

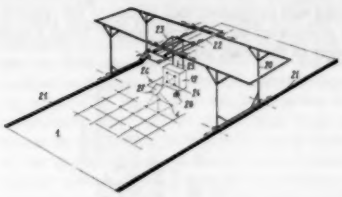
PROCFSS FOR THE REPEATED FABRICATION OF A STRUCTURE

Raymond Burger, 7, place de la Fleur, Sainte-Marie-Aux-Mines (Haut-Rhin), France

Filed Dec. 22, 1981, Ser. No. 333,268
Claims priority, application France, Dec. 22, 1980, 80 27644
Int. Cl.³ B23Q *17/00*
U.S. Cl. 29—407 3 Claims

1. Process for assembling a wooden structure, comprising providing a table having a rectangular reference grid thereon, projecting on the table an image of at least a portion of the wooden structure to be created with at least a portion of a rectangular grid corresponding to the rectangular grid on the

table, as a portion of said image, bringing the rectangular grid of the image into registry with the rectangular grid on the table, assembling a wooden structure from wooden members with interposed connecting members on the table in accordance with said projected image, compressing the wooden members with interposed connecting members against the table to effect assembly of the wooden structure, and removing the assembled wooden structure from the table.



4,426,760

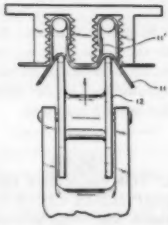
METHOD OF COVERING SURFACES WITH TENSILE SHEET MATERIALS

Warren G. Watts, 1 Little La., Westport, Conn. 06880

Division of Ser. No. 291,411, Aug. 10, 1981, Pat. No. 4,370,792. This application Sep. 30, 1982, Ser. No. 431,116

Int. Cl.[3] **B23Q** *17/00*

U.S. Cl. 29—407 **6 Claims**



1. A method for covering a surface with a tensile sheet material comprising the steps of:

(a) attaching a frame to the surface to be covered, with the frame being made of tracks having two parallel longitudinal slots with each slot having a pair of confronting side walls which are ridged,

(b) cutting the material to a width slightly greater than the distance separating the tracks plus twice the depth of a slot,

(c) inserting one edge of the material and an elastic spline over the material into a slot, whereby the spline is substantially flush with a face of the track,

(d) inserting the opposite edge of the material into a slot of the opposite track with an elastic spline over the material whereby the spline is substantially flush with the face of the track,

(e) setting the spline and material halfway to the bottom of the slot for one edge and then repeating it for the other edge,

(f) setting the spline and material all the way to the bottom of the slot for one edge and then repeating it for the other edge, whereby the material is stretched completely taut between the tracks,

(g) trimming the excess material after it has been set to the bottom of the slot,

(h) attaching a double stick tape to the face of the track,

(i) removing a backing from the double stick tape whereby the adhesive material on the face of the tape is exposed,

(j) inserting the double stick tape into the two adjoining slots, and

(k) inserting a strip of material into the two adjoining slots, whereby the strip of material adheres to the double stick tape and the face of the track between the slots is covered by the material and the assembly has a welted appearance.

4. A method for covering a surface with a tensile sheet material comprising the steps of:

(a) attaching a frame to the surface to be covered with the frame being made of tracks having two parallel longitudinal slots with each slot having a pair of confronting side walls which are ridged,

(b) cutting the material to a width slightly greater than the distance separating the tracks plus twice the depth of a slot,

(c) marking a line on the material near and parallel to an edge thereof,

(d) aligning the line with a first slot of a track and inserting an elastic spline over the line into the slot whereby the spline is substantially flush with the face of the track,

(e) aligning the mid-point of a second edge, which is opposite of the first edge inserted in the slot, with the mid-point of a second slot which is opposite of the first slot into which the material has already been inserted,

(f) pulling the material aligned with the mid-point laterally until it is taut,

(g) inserting a spline over the material into the slot whereby the spline is substantially flush with the face of the track,

(h) setting the spline and material halfway to the bottom of the slot for one edge and then repeating it for the other edge,

(i) setting the spline and material all the way to the bottom of the slot for one edge and then repeating it for the other edge, whereby the material is stretched completely taut between the tracks

(j) trimming the excess material after it has been set to the bottom of the slot,

(k) attaching a double stick tape to the face of the track,

(l) removing a backing from the double stick tape whereby the adhesive material on the face of the tape is exposed,

(m) inserting the double stick tape into the two adjoining slots, and

(n) inserting a strip of material into the two adjoining slots, whereby the strip of material adheres to the double stick tape and the face of the track between the slots is covered by the material and the assembly has a welted appearance.

4,426,761

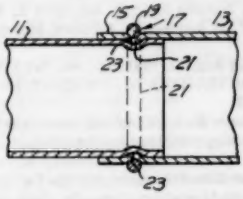
PIPE CLAMP AND METHOD OF CLAMPING

Frank Sassak, Riverview, Mich., assignor to McInerney Spring and Wire Company, Grand Rapids, Mich.

Filed May 21, 1981, Ser. No. 265,901

Int. Cl.[3] **B23P** *11/02;* **B21D** *39/00;* **F16B** *4/00;* **F16L** *19/08*

U.S. Cl. 29—447 **7 Claims**



1. The method of securing together and sealing at their annular overlap a pair of assembled pipes comprising:

assembling a ring body over said pipes at said overlap:

and mechanically swaging and compressing said ring body throughout its circumference reducing its internal diameter;

said swaging employing a compression die including a pair of opposed symmetrical semi-circular die halves pivotally connected together at their one ends;

each die half having a semi-circular die groove therein of semi-circular cross-section;

said die halves having a pair of spaced apart anchors;

said die halves being positionable around and receiving the ring body as assembled over said pipes;

and means interconnecting said anchors for mechanically drawing them together, reducing the internal diameter of said ring body.

4,426,762

METHOD FOR SELECTIVELY OBTURATING AT LEAST ONE END OF A STRUCTURAL MODULE

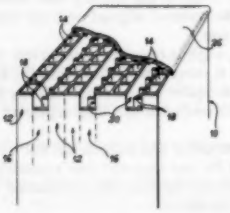
Guy Schnedecker, Paris, France, assignor to Commissariat a l'Energie Atomique, Paris, France

Filed Aug. 14, 1980, Ser. No. 178,009

Claims priority, application France, Aug. 28, 1979, 79 21542

Int. Cl.³ B22D *11/126*

U.S. Cl. 29—527.4 **12 Claims**



1. A method for selectively obturating at least one end of a structural module having rows of parallel first and second ducts for the passage of first and second fluids, respectively, said ducts being elongated and having open ends, said method comprising forming notches in portions of said at least one end of the module at locations corresponding with said first ducts, said notches providing openings through the lateral wall of the module which communicate with the first ducts, depositing an impervious material over said at least one end of the module, the step of depositing said impervious material including spraying the impervious material in a liquid state intermittently during projection periods separated by longer cooling periods, the impervious material being sprayed at an angle between 18° and 30° with respect to the elongated dimension of the ducts and onto the open ends of the ducts to obturate the second ducts and leave lateral free access to the first ducts.

4,426,763

TOOL CHANGER

Emery Hornok, Natrona Heights, and Gary L. Killian, Pittsburgh, both of Pa., assignors to Aerotech, Incorporated, Pittsburgh, Pa.

Filed Aug. 28, 1981, Ser. No. 297,333

Int. Cl.³ B23Q *3/157*; G05B *19/27*

U.S. Cl. 29—568 **18 Claims**

1. A tool changer for a milling machine or the like having a spindle for receiving a tool holder comprising:

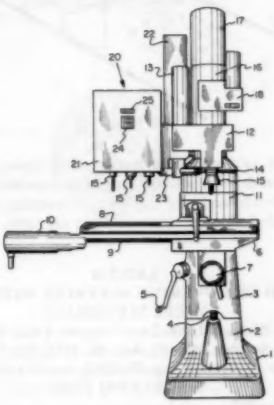
a tool store, said tool store comprising an orbiting chain having spaced tool hangers thereon for receiving tool holders, a ready position along the chain at which tool holders may be secured or released from the tool hangers, said tool store mounted to said milling machine.

a twin claw arm, said twin claw arm movable on an up/-down axis, rotatable through 180 degrees and having two claws expandable and retractable along a radial axis, said arm mounted relative to said tool store such that in the expanded position, the claws may engage tool holders at both the ready position of the tool store and in the spindle of the milling machine,

means for storing a designation of which tool holder is in which tool hanger and which tool is in the spindle.

means for receiving instructions designating a tool holder for moving said designated tool holder to the spindle,

means for positioning the orbiting chain to bring a desired tool hanger to the ready position,



means for activating the twin claw arm through its described motions,

means responsive to said instructions for developing command signals to the means for positioning the orbiting chain and means for activating the twin claw arm to exchange the designated tool holder with the tool holder in the spindle of the milling machine.

4,426,764

SEMICONDUCTOR MEMORY DEVICE WITH PERIPHERAL CIRCUITS

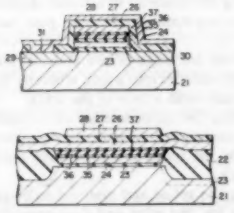
Yasunobu Kosa, Kodaira, and Shinji Shimizu, Koganei, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation of Ser. No. 891,030, Mar. 28, 1978, abandoned. This application Mar. 9, 1981, Ser. No. 241,539

Claims priority, application Japan, Apr. 6, 1977, 52-38528

Int. Cl.³ H01L *21/22*

U.S. Cl. 29—571 **23 Claims**



1. A method of manufacturing a nonvolatile semiconductor memory device comprising the steps of: forming a first semiconductive layer on a first insulating film covering a surface of a semiconductive substrate; forming a second insulating film, serving as a mask for oxidation, so as to cover said first semiconductive layer; selectively removing in a self-aligned manner portions of said second insulating film and said first semiconductive layer so as to provide a first strip of the remaining portions of the second insulating film and first semiconductive

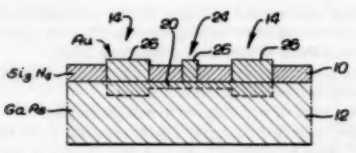
layer extending in a direction; oxidizing the surface of said substrate by using the remaining portions of the second insulating film as a mask for the oxidation so as to form a field insulator on areas of the substrate not covered with the remaining portion of the second insulating film on both sides of said strip, the field insulator being self-aligned with the strip; forming a second semiconductive layer over said second insulating film and said field insulator; selectively removing said second semiconductive layer so as to provide a second strip of the remaining portion of the second semiconductive layer extending transversely with respect to said first strip, and selectively removing portions of the first strip so as to form a floating gate of the remaining part of the first semiconductive layer self-aligned with the second strip; and introducing impurities of a conductivity type opposite to the conductivity type of the substrate into areas of the substrate not covered with the field insulator and second strip, so as to form source and drain regions self-aligned with the second strip and floating gate.

4,426,765

PROCESS FOR FABRICATION OF OHMIC CONTACTS IN COMPOUND SEMICONDUCTOR DEVICES

Iradj Shahriary, Santa Monica, and Thomas G. Mills, Carson, both of Calif., assignors to TRW Inc., Redondo Beach, Calif.

Filed Aug. 24, 1981, Ser. No. 295,924
Int. Cl.³ H01L *21/283, 21/225*
U.S. Cl. 29—571 **8 Claims**



1. A method of fabricating ohmic contacts in a semiconductor device having a compound semiconductor substrate, said method comprising the steps of:

selectively depositing a thin layer of material on the substrate;

implanting ions in the substrate through the deposited layer, said implanting step being a normal step in a field-effect transistor (FET) fabrication process;

annealing the entire device to relieve ion implantation damage, said annealing step being a normal step in the FET fabrication process;

diffusing the material in the thin layer into the ion-implanted substrate, to form ohmic contact regions as a result of said annealing step; and

depositing metal on the ohmic contact regions, said depositing step being the normal metalization step used to form non-ohmic contacts in the FET fabrication process;

whereby said method of forming ohmic contacts is integrated into the normal FET fabrication process by the inclusion of only said selectively depositing step.

4,426,766

METHOD OF FABRICATING HIGH DENSITY HIGH BREAKDOWN VOLTAGE CMOS DEVICES

William W. Y. Lee, Fountain Valley, Calif., assignor to Hughes Aircraft Company, El Segundo, Calif.

Filed Oct. 21, 1981, Ser. No. 313,395
Int. Cl.³ H01L *21/265*
U.S. Cl. 29—571 **15 Claims**

1. A method of fabricating complementary insulated gate semiconductor devices comprising the steps of:

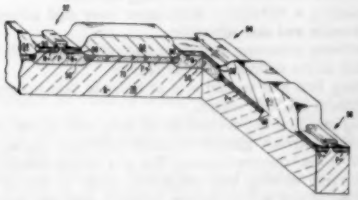
(a) providing an oxide layer on a major surface of a semiconductor substrate of a first conductivity type, said oxide layer overlying a plurality of first and second surface regions of said substrate;

(b) forming a number of oxygen-impermeable masks on said oxide layer, each said mask overlying a corresponding one of said first or second surface regions;

(c) growing an additional thickness of oxide on the unmasked portion of said oxide layer to form an intermediate field oxide layer thereon, said layer including an oxide beak extending between the margin of each said oxygen-impermeable mask and the respective underlying portion of said substrate surface;

(d) forming over said substrate surface an etch resistant mask having a number of windows therein, each said window exposing at least one of said oxygen impermeable masks overlying said first surface regions of said substrate and, at least, an immediately surrounding portion of said intermediate field oxide layer;

(e) ion implanting a first impurity of a second conductivity type into said substrate with sufficient energy for said impurity ions to pass through each said exposed oxygen-impermeable mask and the underlying oxide layer to form zones of impurity atoms under the surface but with insufficient energy to pass through said intermediate field oxide layer or said etch resistance mask;



(f) etching away those portions of said intermediate field oxide layer exposed by said etch resistant mask to expose the underlying surface of said substrate;

(g) removing said etch resistant mask;

(h) thermally diffusing each said zone of first impurity atoms into the bulk of said substrate to form wells therein, each well underlying one of said first surface regions of said substrate;

(i) ion implanting a second impurity of said second conductivity type into said substrate with sufficient energy to form a zone of second impurity atoms at the exposed surface thereof, but with insufficient energy to pass through either said oxygen-impermeable masks or said intermediate field oxide layer;

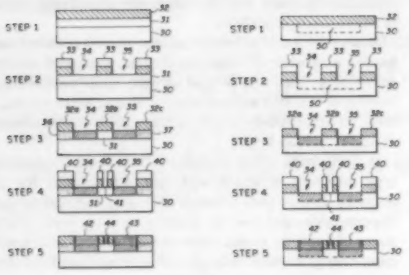
(j) growing an additional thickness of oxide on the exposed portion of said substrate surface to form a final field oxide layer thereon; and

(k) removing said oxygen-impermeable masks and the underlying oxide layer to expose said first and said second surface regions of said substrate, selectively forming gate insulation and electrode layers on said surface regions, forming insulated gate field effect transistors' source and drain regions of said first conductivity type in the substrate of said first surface regions and having said second surface regions, and connecting said transistors to form complementary insulated gate semiconductor devices.

4,426,767
SELECTIVE EPITAXIAL ETCH PLANAR PROCESSING FOR GALLIUM ARSENIDE SEMICONDUCTORS

Alan W. Swanson, Marlboro; Charles R. Snider, Southborough, and Frank H. Spooner, Concord, all of Mass., assignors to Sperry Corporation, New York, N.Y.

Filed Jan. 11, 1982, Ser. No. 338,204
Int. Cl.³ H01L *21/20, 21/302*
U.S. Cl. 29—571 **11 Claims**



1. A method for fabricating semiconductor devices on gallium arsenide semi-insulating substrates comprising the steps of:

disposing a region of active gallium arsenide material in contact with said semi-insulating substrate;

depositing a refractory mask layer over said active gallium arsenide and said substrate;

selectively removing regions of said refractory mask to expose said active gallium arsenide region;

etching first and second sets of holes in said exposed active gallium arsenide region;

filling said first and second set of holes with vapor phase epitaxially grown gallium arsenide having a doping level of $10^{19}e/cm^3$ thereby forming first and second contact regions;

selectively etching said refractory mask to expose selected areas of said active gallium arsenide disposed between said first and second contact regions and thereby defining third regions; and

metallizing said first, second and third regions thereby forming ohmic contacts in said first and second regions.

4,426,768
ULTRA-THIN MICROELECTRONIC PRESSURE SENSORS

James F. Black, Newington; Thomas W. Grudkowski, Glastonbury, and Anthony J. DeMaria, West Hartford, all of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Dec. 28, 1981, Ser. No. 334,759
Int. Cl.³ H01L *21/20, 21/22*
U.S. Cl. 29—583 **2 Claims**

1. A method of forming a plurality of ultra-thin microelectronic pressure sensors comprising:

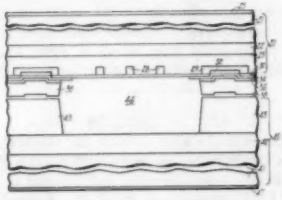
processing a first wafer having a first thick undoped silicon substrate extending from a first surface of said first wafer and a first highly doped silicon etch stop layer adjacent to said substrate to provide a plurality of devices at a second surface of said first wafer, each of which provides an electrical characteristic which varies with strain at said second surface;

providing a layer of borosilicate glass over the entire second surface of said first wafer except in the regions where said devices are formed;

processing a second wafer having a second thick undoped silicon substrate extending from a first surface of said second wafer and a second highly doped silicon etch stop layer adjacent to said substrate to provide a plurality of cavities in said second wafer extending from a second surface of said second wafer, each of said cavities disposed on said second wafer so that, with said first and second wafers properly registered with their second surfaces adjacent one another, each of said devices will be disposed adjacent to a corresponding one of said cavities;

contacting the borosilicate glass layer of said first wafer with said second surface of said second wafer, with said wafers registered so that each of said cavities is adjacent to a corresponding one of said devices;

joining said wafers by field assisted bonding in a vacuum to provide a composite wafer including a plurality of absolute pressure sensors, each formed by a corresponding set of a device and a cavity;



stripping said second undoped silicon substrate from said composite wafer by etching from said first surface of said second wafer to said second etch stop layer;

cutting said composite wafer into a plurality of chips, each having one of said pressure sensors;

bonding each of said chips to a metallic carrier;

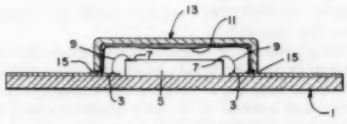
stripping said first undoped silicon substrate from each of said chips by etching from said first surface of said first wafer to said first etch stop layer; and

providing conductors on each of said chips to make electrical contact with the devices thereon.

4,426,769
MOISTURE GETTER FOR INTEGRATED CIRCUIT PACKAGES

Dimitry G. Grabbe, Lisbon Falls, Me., assignor to AMP Incorporated, Harrisburg, Pa.

Filed Aug. 14, 1981, Ser. No. 292,989
Int. Cl.³ H01L *21/56*
U.S. Cl. 29—588 **1 Claim**



1. A method of forming an hermetically sealed integrated circuit package comprising the steps of:

(a) providing a substrate having a lead structure thereon,

(b) assembling a semiconductor chip onto said substrate,

(c) making appropriate interconnection between said chip and said substrate,

(d) providing a cap having a polyimide getter material therein capable of retaining its getter properties after exposure to sealing temperatures,

(e) placing said cap on said substrate enclosing said chip,

(f) placing a sealant between said cap and said substrate, and

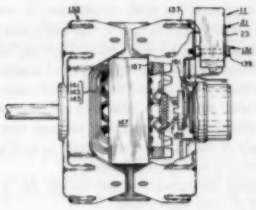
(g) heating said cap, sealant and substrate to hermetically seal said cap to said substrate.

4,426,770

METHOD OF ASSEMBLING A SWITCH AND TERMINAL ASSEMBLY AND MOUNTING IT TO A DYNAMOELECTRIC MACHINE

James P. Frank, Rock Falls, Ill., assignor to General Electric Company, Fort Wayne, Ind.

Division of Ser. No. 884,097, Mar. 6, 1978, Pat. No. 4,294,004, which is a division of Ser. No. 671,965, Mar. 30, 1976, Pat. No. 4,095,073. This application Feb. 27, 1981, Ser. No. 239,016
Int. Cl.³ H02K 15/00
U.S. Cl. 29—596 31 Claims



1. A method of assembling a switch and terminal assembly and mounting it to a component of a dynamoelectric machine comprising the steps of:

disposing a plurality of terminals generally in row formation along wall means of a pair of separable casing members with electrical connection sections of the terminals exposed beyond the wall means, respectively;

positioning a grounding device generally exteriorly of another wall means of one of the casing members with a ground connection section of the ground terminal extending into spaced relation and into the row formation with the electrical connection section of at least some of the terminals and interconnecting at least a part of the other of the casing members with the grounding device so as to retain the casing members against separation and the grounding device against displacement with respect to the another wall means of the one casing member; and

passing an electrically conducting mounting member through means provided to accommodate it in the grounding device and the casing members into mounting engagement with the dynamoelectric component so as to mount the switch and terminal assembly thereto and complete a ground circuit between the grounding device and the dynamoelectric machine component.

4,426,771

METHOD OF FABRICATING A STATOR FOR A MULTIPLE-POLE DYNAMOELECTRIC MACHINE

David C. Wang, Allen County, Ind., and Harry W. Voepel, Lincoln County, Mo., assignors to Emerson Electric Co., St. Louis, Mo.

Filed Oct. 27, 1981, Ser. No. 315,288
Int. Cl.³ H02K 15/06
U.S. Cl. 29—596 8 Claims

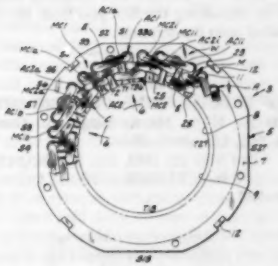
1. The method of fabricating a stator for a multiple-pole dynamoelectric machine, said stator comprising a core assembled from a stack of laminations of suitable ferromagnetic sheet-material, said core having a central bore extending therethrough and a plurality of blind slots extending radially outwardly from said bore, said slots being substantially equally angularly spaced around said bore, said stator comprising an auxiliary winding and a main winding, each of the auxiliary and main windings having first and second sets of coils, each set comprising a plurality of coils of suitable magnet wire electrically connected to one another and inserted into said slots, each of said coils having a pair of end turns and a pair of generally straight coil sections extending between said end turns, wherein the method of this invention comprises the steps of:

A. forming the sets of said main winding by forming the same number of coils of magnet wire of a desired size as the number of the poles in said dynamoelectric machine, each of said coils of each of said main winding being electrically connected in a desired pattern;

B. forming the sets of said auxiliary winding by forming the same number of coils of magnet wire of a desired size as the number of poles in said dynamoelectric machine, each of said coils of each of said auxiliary winding sets being electrically connected in a desired pattern; and

C. inserting said auxiliary and main windings in said slots of said core in the following manner so that the coils of said auxiliary and main windings are grouped together in layered fashion in said core by;

i. inserting a first coil of a first set of one of said windings in said core with said straight coil sections of said first coil being received in a first and a third slot of said core,



ii. inserting a first coil of a first set of the other of said windings in said core with said straight coil sections of said first coil of said second winding being received in a second and a fourth core slot,

iii. inserting a first coil of a second set of said one winding in said stator core with said straight coil sections of said second coil of said first winding being received in the third and in a fifth core slot,

iv. inserting a first coil of a second set of said other winding in said stator core with the straight coil sections of said second coil of said other winding being received in the fourth and in a sixth core slot, whereby the inserted coils constitute a first layered grouping of coils in slots 1–6 of said core, and

v. repeating steps (C) (i) through (C) (iv) to form a second layered group of coils in slots 5–10 of said core, and repeating said steps (C) (i) through (C) (iv) until all of said coils are inserted in said core.

4,426,772

APPARATUS FOR INSTALLING TERMINALS ON WIRES AND INSULATION PODS ON TERMINALS

John C. Collier, York, and David L. Lehman, Lewisberry, both of Pa., assignors to Burndy Corporation, Norwalk, Conn.

Filed Feb. 19, 1981, Ser. No. 235,619
Int. Cl.³ B23P 19/00
U.S. Cl. 29—742 8 Claims

1. Apparatus for attaching a terminal to a wire and thereafter installing a pod on the terminal comprising:

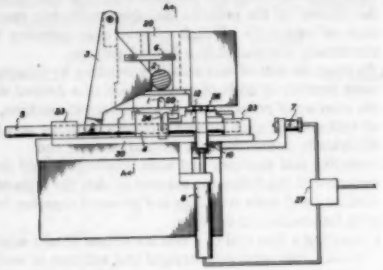
(a) means for attaching the terminal onto the wire in response to the wire being placed into a terminating station thereby producing a terminated wire,

(b) means for placing the terminated wire on a transfer means at the terminating station,

(c) means for moving the transfer means and wire to an adjacent pod installation station,

(d) means for removing the terminated wire from the transfer means, and

(e) means for installing a pod onto the terminal wherein the pods are fed to the pod installation station in a strip inter-



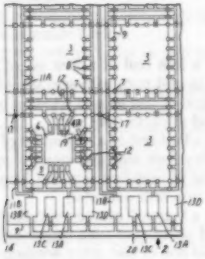
connected to one another, said installing means including means for separating the first pod from the strip before it is installed onto the terminal.

4,426,773

ARRAY OF ELECTRONIC PACKAGING SUBSTRATES

Billy M. Hargis, Hugo, Minn., assignor to General Electric Ceramics, Inc., Cleveland, Ohio

Filed May 15, 1981, Ser. No. 263,915
Int. Cl.³ H05K *3/30, 1/11*
U.S. Cl. 29—832 **9 Claims**



1. An array of electronic packaging substrates comprising:

a multiplicity of electronic packaging substrates in horizontal and vertical rows located in a plane, each substrate having a plurality of internal and external terminals which are electrically interconnected,

said array having lines of separation along which each substrate is separable from said array, a plurality of adjacent rows of substrates having lines of separation therebetween that are spaced and parallel,

at least a pair of primary metallized traces for providing electrical interconnection to said substrates, wherein at least one of said pair is between at least some of said spaced parallel lines of separation between adjacent rows of substrates, and wherein the first of said pair is electrically interconnected by secondary metallized traces to at least the same internal terminal of each said substrate in said rows adjacent said primary metallized traces, and wherein the second of said pair is electrically interconnected by secondary metallized traces to at least the same other internal terminal of each said substrate in said rows adjacent said primary metallized traces, and wherein said internal terminal connected to said first of said pair is electrically isolated from said internal terminal connected to said second of said pair, and

an electrical contact point on said array electrically connected to each said primary metallized trace

6. A method for testing a multiplicity of electronic components, said method comprising the steps of:

A. providing an array of electronic packaging substrates, said array comprising a multiplicity of electronic packaging substrates in horizontal and vertical rows located in a plane each substrate having a plurality of internal and external terminals which are electrically interconnected; said array having (1) lines of separation along which each substrate is separable from said array, (2) a plurality of adjacent rows of substrates having lines of separation therebetween that are spaced and parallel, (3) at least a pair of primary metallized traces for providing electrical interconnection to said substrates, at least one of said primary metallized traces being between at least some of said spaced parallel lines of separation between adjacent rows of substrates, (4) an electrical contact point on said array electrically connected to each said primary metallized trace, and (5) a plurality of secondary metallized traces electrically connecting at least one of said internal terminals of each of said substrates in said adjacent rows to said primary metallized traces;

B. mounting electronic components on a predetermined number of said substrates;

C. electrically connecting said electronic components to said internal terminals of said substrates; and

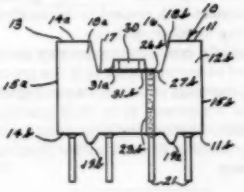
D. selectively applying predetermined electrical potentials to only certain of said internal terminals of each said substrates throughout said array at a predetermined temperature and for a predetermined time.

4,426,774

PROCESS FOR PRODUCING A CIRCUIT MODULE

Ronald L. Stuckey, Monroe, Ind., assignor to CTS Corporation, Elkhart, Ind.

Division of Ser. No. 153,843, Apr. 7, 1980, Pat. No. 4,345,300.
This application May 3, 1982, Ser. No. 374,420
Int. Cl.³ H05K *3/30*
U.S. Cl. 29—841 **10 Claims**



1. A process for producing a circuit module supporting a discrete electrical device without contributing to the width of the circuit module, comprising the steps of: forming a ceramic substrate having a recess in an end surface thereof, disposing conductive means on a surface of the recess and electrical circuit means including metallized conductive paths on a side of the substrate whereby the conductive means is electrically connected to the circuit means, securing terminal means to said substrate and in electrical connection with selected conductive paths, disposing a discrete electrical device of preselected electrical function within said recess with the discrete electrical device proportioned to be disposed wholly within said recess, connecting by electrical and mechanical means the discrete electrical device to the conductive means, and filling the entirety of the unoccupied portion of said recess with an electrically inert material to produce substantially planar side surfaces and end surface means to encapsulate and electrically protect the electrical device confined within said material whereby the stack-up tolerances of a plurality of such modules disposed in side-by-side contiguous relationship corresponds substantially to the cummulative widths of the substrates.

4,426,775

METHOD FOR THE PRODUCTION OF CONDUCTOR TRACKS APPLIED TO A SUPPORT

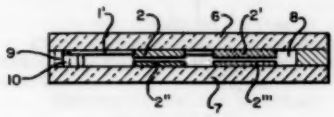
Wolfgang Faust, Hofheim; Friedrich W. Nickol, Eppstein, and Holm Baeger, Schwalbach, all of Fed. Rep. of Germany, assignors to VDO Adolf Schindling AG, Frankfurt am Main, Fed. Rep. of Germany

Filed Jun. 29, 1981, Ser. No. 278,247

Claims priority, application Fed. Rep. of Germany, Jun. 17, 1980, 3024213

Int. Cl.³ H05K *3/10*

U.S. Cl. 29—846 **16 Claims**



1. In a method of producing conductor tracks applied to a support, particularly conductor tracks applied on an electrode support of a liquid-crystal display, in which a mask having openings corresponding to the conductor tracks is placed on the support and a conductive layer of electrically conductive material is applied through said openings to the support corresponding to the openings, the improvement comprising the steps of

forming the mask with openings disposed partially along paths corresponding to said conductor tracks to be produced leaving interruptions at given points along said paths formed by support webs in the mask which serve as said interruptions and provide a mechanically stable shape to said mask in its plane for strengthening the mask against deformation,

partially forming the conductor tracks on the support with interruptions in the conductor tracks masked by the support webs in a first operation by applying the conductive layer of electrically conductive material through the openings of the mask onto the support, and

in a second operation, bridging the interruptions in the conductor tracks on the support by applying additional electrically conductive material in the interruptions.

4,426,776

ELECTRIC SHAVER

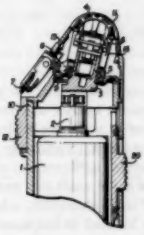
Hiromi Kakumoto; Shinji Ihara; Yoji Iguchi, and Makoto Miyata, all of Hikone, Japan, assignors to Matsushita Electric Works, Ltd., Osaka, Japan

Filed Jun. 4, 1982, Ser. No. 384,888

Claims priority, application Japan, Jun. 15, 1981, 56-92734

Int. Cl.³ B26B *19/10*

U.S. Cl. 30—34.1 **16 Claims**



1. An electric dry shaver with a trimmer, comprising:

a casing;

a support piece mounted on one end of said casing;

a shaving head enclosure mounted on said support piece, said shaving head enclosure including a perforated shaving comb;

an electric motor disposed within said casing, said motor having a rotatable shaft;

an eccentric cam connected to said rotatable shaft to convert the rotating motion of said shaft to reciprocating motion;

a drive element connected to said eccentric cam, said drive element sharing in the reciprocating motion of said cam, said drive element having a lower portion and an upper portion, said lower portion being that closest to said cam, said upper portion being that furthest from said cam;

a cutter blade platform detachably mounted on said upper portion of said drive element by a connecting pin;

a set of parallel cutter blades mounted on said cutter blade platform, said cutter blades and said cutter blade platform sharing in the reciprocating motion of said drive element so that said cutter blades reciprocate beneath said perforated shaving comb within said shaving head enclosure;

a trimmer mounting base disposed between said support piece and said shaving head enclosure;

a trimmer, one end of said trimmer pivotably mounted on said trimmer mounting base, the other end of said trimmer having trimmer blades;

a trimmer handle slidably mounted on said casing, one end of said handle connected to a fulcrum on said trimmer between said pivot end and said trimmer blade end of said trimmer to rotate said trimmer upward and outward from said trimmer mounting base;

a trimmer drive stem extending from the pivot end of said trimmer;

a flexible sealing plate disposed between said mounting piece and said drive element, said plate having a central opening through which said drive element may project, said plate having an inner annular bead around said opening and an outer bead at the edge of said plate; said inner bead engaging said drive element and sharing in the reciprocating motion of said drive element, said outer bead engaging said mounting piece, whereby said motor is sealed from said perforated shaving comb and said trimmer;

a drive lever ring disposed around said drive element above said plate and sharing in the reciprocating motion of said drive element, said drive lever ring having a trimmer drive lever extending therefrom, said trimmer drive lever being engageable with said trimmer drive stem when said trimmer is rotated upward and outward by said trimmer handle, whereby said trimmer blades share in the reciprocating motion of said drive element.

4,426,777

ELECTRIC DRY SHAVER

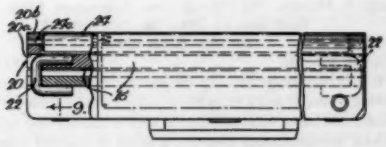
Donald J. Coleman, Lisle; Wilbur C. Jackson, Wheaton; Robert R. Lube, Countryside, and Albert R. Spohr, Park Ridge, all of Ill., assignors to Sunbeam Corporation, Chicago, Ill.

Division of Ser. No. 163,743, Jun. 27, 1980, Pat. No. 4,389,772.

This application Mar. 18, 1983, Ser. No. 476,643

Int. Cl.³ B26B *19/42*

U.S. Cl. 30—34.2 **3 Claims**



1. An electric shaver head comprising a perforated relatively flexible comb, a comb supporting frame having a plurality of double arched bars connecting two side bars with an intermediate support bar, said perforated comb being secured at two opposite parallel edges to said side bars, a tension bar overlying

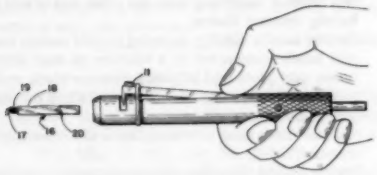
the middle of said comb to draw said comb into intimate engagement with said double arched bars, said tension bar having an outwardly opening passageway at either end thereof, U-shaped retention clips at each end of said tension bar with one leg of each clip engaged beneath said intermediate support bar and the other leg of each clip extending into one of said outwardly opening passageways, a skin engaging friction reducing roller supported by said tension bar in spaced parallel relation thereto.

4,426,778

DEVICE FOR STRIPPING WIRE AND CABLE

Walter E. Christie, Derry, N.H., assignor to Avco Corporation, Wilmington, Mass.

Filed Dec. 14, 1981, Ser. No. 330,246
Int. Cl.³ H02G 1/12
U.S. Cl. 30—90.1 **6 Claims**



1. A tool for stripping the outer insulating jacket from a portion of wire or cable comprising:

an elongated body having a longitudinally extending passage constructed therein to receive the cable, said body being constructed with a transverse aperture to provide access to the cable;

a lever arm mounted on the body for manually actuated pivotal movement and constructed with a transversely fixed knife blade situated to pivot into and out of cutting engagement with the outer insulating jacket of the cable through the access aperture;

a cam transversely mounted on the lever arm adjacent to the knife blade to pivot into and out of contact engagement with the outer insulating jacket of the cable through the access aperture to limit the cutting engagement of the knife blade, said cam having substantially a point contact with said cable; and

means mounted on the body to resiliently bias said lever arm and knife blade into cutting engagement with the outer insulating jacket of the cable.

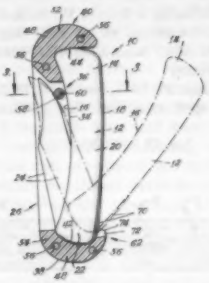
4,426,779

CLASP KNIFE HOLDER

Orrin B. Morgan, 214 Chicago Ave., Kalamazoo, Mich. 49001

Filed Jan. 11, 1982, Ser. No. 338,223
Int. Cl.³ B26B 29/02
U.S. Cl. 30—138 **19 Claims**

1. A clasp knife holding device for holding a clasp knife having a handle and a main blade adapted to be folded into said handle and being spring-biased in such a manner that when it is moved toward closed position, a point is reached where it is spring-biased toward closed position and when it is moved toward open position, a point is reached where it is spring-biased toward open position, comprising holding means for holding said knife in position so that the handle can be grasped by a hand of the user, said knife blade being in a position in which it is spring-biased toward closed position; and knife blade opening means in said holding means operative when said knife is withdrawn from said holding means to pull said



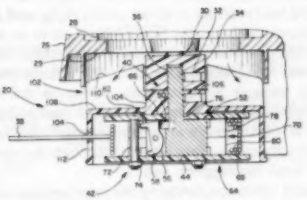
blade at least to a position where it is no longer spring-biased toward closed position.

4,426,780

LINE METERING APPARATUS

Leslie W. Foster, Wayzata, Minn., assignor to The Toro Company, Minneapolis, Minn.

Filed Sep. 3, 1981, Ser. No. 298,966
Int. Cl.³ B65B 7/00
U.S. Cl. 30—276 **2 Claims**



1. A vegetation cutting device in which a flexible filament is rotatably driven about a substantially vertical axis with a free end of the filament defining a cutting plane, and the device having a power source with a drive shaft, apparatus for metering discrete lengths of filament comprising:

(a) driving means coupled to the drive shaft for rotation therewith, wherein the driving means comprises:

(i) a hub member secured to the drive shaft; and

(ii) a pawl pivotably mounted on the hub member, wherein the pawl has upper and lower dogs;

(b) driven means selectively coupled to the driving means, wherein the driven means comprises:

(i) an upper ring having a plurality of spaced barrier abutment surfaces oriented substantially along radial lines extending from the drive shaft axis and facing in a counter-rotating drive shaft direction, wherein the barrier abutment surfaces are located in the same plane as the upper dog of the pawl such that the upper dog can engage against a barrier abutment surface to rotate the driven means in synchronization with the drive shaft;

(ii) a lower ring having a plurality of spaced stop abutment surfaces oriented substantially along radial lines extending from the drive shaft axis and facing in the rotational direction of the drive shaft, wherein the stop abutment surfaces are located in the same plane as the lower dog of the pawl such that the lower dog impacts against a stop abutment surface to stop relative rotation between the driven and driving means; and

(iii) means for pivoting the pawl from a first position in which the upper dog engages a barrier abutment surface to a second position in which the lower dog engages a

stop abutment surface, wherein the pivoting means is operative during relative rotation between the driven and driving means;

(c) spool means upon which the flexible filament is wound, wherein the spool means is secured to the driven means for rotation therewith; and

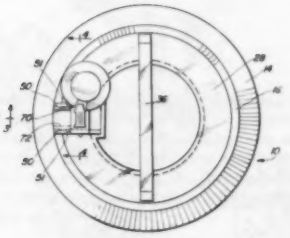
(d) means for de-energizing the drive shaft to allow the driven means to rotate relative to the driving means until the lower dog impacts against a stop abutment surface, whereby a discrete increment of filament is payed out from the spool during the relative rotation of the driven means.

4,426,781

CUTTER FOR MAKING PAPER DISCS

Fred Kufrin, Janesville, Wis., assignor to Badge A. Minit Ltd., LaSalle, Ill.

Filed May 27, 1982, Ser. No. 382,625
Int. Cl.³ B26B *27/00*
U.S. Cl. 30—310 **8 Claims**



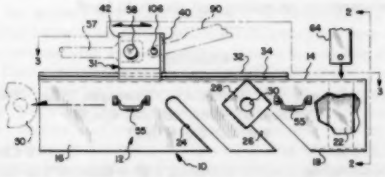
1. A disc paper cutter comprising an outer stationary ring having upper, lower and side walls, an annular recess in the inner side of said side wall, an inner revolving ring shiftably seated in the periphery in said recess to retain said inner ring in said recess, an adjustable cutter blade on said inner ring for movement both upwardly and downwardly, a short hollow cylindrical member having an upper end integrally formed adjacent the periphery of said inner ring, a series of index teeth on the upper end of said cylindrical member, an axial opening extending through said cylindrical member, an elongated collet having opposed clefts positioned in said axial opening with an annular cam on the upper surface thereof, a pair of opposed, downwardly depending lugs on the lower surface of said cam for engagement with said index teeth for raising and lowering said cutter blade.

4,426,782

ATTACHMENT FOR A BACKHOE ARM

Jerry Baisden, 2758 Merritt St., Springfield, Ohio 45503

Filed Jul. 12, 1982, Ser. No. 397,639
Int. Cl.³ B27L *7/00*; B23D *45/20*
U.S. Cl. 30—379.5 **9 Claims**



1. An attachment for selective mounting and operating one of a variety of tools, at least one of the selectable tools being movably operable by movement of a first tool portion with respect to a second tool portion by a lever detachably connected to the first tool portion, each of the tools having a rigid bar mounted thereto, said attachment being for removable attachment to the arm of a backhoe machine from which the bucket has been removed, the backhoe further having a hydraulic cylinder disposed along the arm normally for pivoting the bucket when in place on the arm, said attachment comprising:

a frame fittable on the backhoe arm at its outer end having a first end and a second end, said second end defining the outer end of said frame when in place on the arm;

means for fastening said frame to the arm;

said frame having an opening therein substantially at said second end for insertion of one of the bars thereinto, thereby mounting a selected one of the tools to said frame;

means for retaining the bar within said opening;

a sliding member connectable with the end of the cylinder for movement thereby along said frame;

guide means for directing said sliding member along said frame between said first end and said second end; and

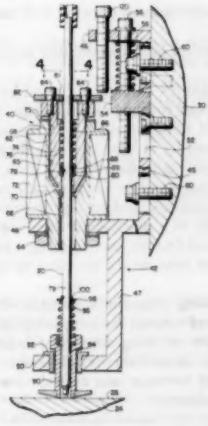
means for selectively coupling the lever to said sliding member for movement of the lever by movement of said sliding member when the movably operable tool is selectively mounted to said frame.

4,426,783

MARKING INSTRUMENT ACTUATOR FOR PLOTTING APPARATUS OR THE LIKE

Heinz J. Gerber; Yuval Mishli, both of West Hartford; Vincent J. Carulli, Ellington, and Joseph H. Cohen, West Hartford, all of Conn., assignors to Gerber Garment Technology, Inc., South Windsor, Conn.

Filed Sep. 18, 1981, Ser. No. 303,639
Int. Cl.³ G01D *15/24*
U.S. Cl. 33—1 M **12 Claims**



1. In a plotting apparatus or the like having means defining a plotting surface for supporting a sheet of plotting material, a carriage assembly, means supporting the carriage assembly for movement relative to the plotting surface, a plotting head assembly supported on the carriage assembly and including an axially elongated marking instrument having a marking end and actuating means coaxially surrounding an associated portion of the marking instrument for moving the instrument into marking engagement with plotting material supported on the plotting surface, and drive means for moving the carriage assembly relative to the plotting surface to move the marking instrument relative to the plotting material, the improvement comprising first resilient means for connecting said marking instrument to said actuating means, presser foot means for

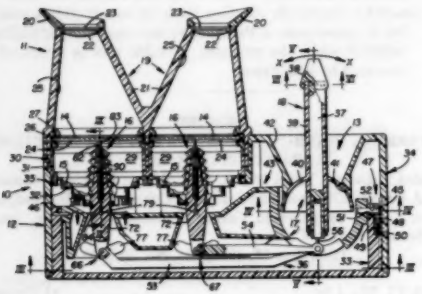
engagement with the plotting material supported on said plotting surface, and second resilient means acting between said presser foot means and said marking instrument for normally maintaining a constant clearance distance between said marking end and said plotting surface when said marking instrument is out of marking engagement with the plotting material.

4,426,784

MULTI-MEDIUM THREE-DIMENSIONAL DRAWING TOOL

Peter H. Stephens, 636 Stanyan St., San Francisco, Calif. 94117

Continuation-in-part of Ser. No. 245,306, Mar. 19, 1981, Pat. No. 4,343,091. This application Jul. 12, 1982, Ser. No. 397,088
The portion of the term of this patent subsequent to Aug. 10, 1999, has been disclaimed.
Int. Cl.³ B43L *13/00*
U.S. Cl. 33—18 R **12 Claims**



1. A three-dimensional drawing tool comprising:
a housing,
first and second light transmitting screens mounted on said housing,
ground means for defining a ground beneath each screen,
first and second forming means compatible with said ground means for simultaneously creating individual designs on said ground by at least one of adding on and subtracting composition material from said ground,
operator control means for simultaneously moving and for moving said first and second forming means relative to each other in a preselected direction adjacent to undersides of said first and second screens to define said individual and at least nearly identical designs on said ground, and
optical viewing means in alignment with each of said first and second screens for stereoscopically viewing individual images resulting from said individual designs as a composite three-dimensional image, said ground being positioned between said optical viewing means and said forming means.

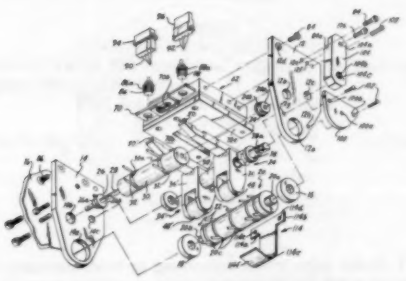
4,426,785

METHOD AND APPARATUS FOR DETECTING ABNORMAL THICKNESS CONDITIONS SUCH AS FOLDED AND/OR MISSING CORNERS OF MOVING SHEETS

Peter J. Loftus, 56 Roving Rd., Levittown, Pa. 19056, and Stephen J. Horvath, 5752 Prescott Ct., Bensalem, Pa. 19020

Filed Jan. 4, 1982, Ser. No. 336,790
Int. Cl.³ G01B *7/04*; B65H *3/14*
U.S. Cl. 33—147 L **52 Claims**

1. Apparatus for detecting abnormalities in the thickness of sheets fed to said apparatus in single file at substantially regularly spaced intervals with finite gaps between adjacent sheets, said apparatus comprising:
a first roller formed of a hard material being rotatable about a first, fixed axis;
a displaceable assembly mounted to swing about a second fixed axis;
a second roller formed of a hard material having a smooth cylindrical surface and being rotatably mounted on said displaceable assembly a predetermined distance from said second fixed axis;
high speed drive means for positively driving and thereby rotating said first roller at high speed;
said drive means including resilient means entrained about said first roller and engaging said second roller to rotate said second roller even in the absence of sheets;
field generating means mounted on said assembly a second predetermined distance from said second fixed axis;
biasing means normally positioning said second roller adjacent said first roller by exerting a strong force upon said displaceable assembly for urging said second roller toward said first roller responsive to displacement of said second roller from said first roller and compressing said resilient means;



adjustable means for adjusting the strength of the biasing force exerted by said bias means upon said displaceable assembly;
stationary sensing means positioned adjacent said field generating means for generating a signal representing the measured field strength of the field developed by said field generating means, said signal representing the displacement distance of said second roller relative to said first roller due to sheets passing therebetween;
means for comparing the signal of said sensing means against a predetermined thickness threshold;
the force of said bias means being sufficient to significantly attenuate overshoot of the displaceable assembly and to substantially prevent "bounce" of said assembly while enabling the second roller means to accurately track the thickness profile of the sheet to thereby significantly enhance the ability of said sensor to generate a signal which accurately represents the thickness profile of a sheet passing between said first and second rollers and thereby prevent the signal developed by said sensing means from erroneously exceeding said threshold level.

4,426,786

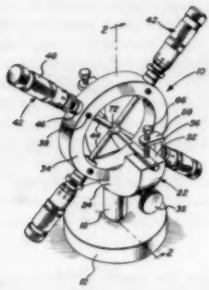
CENTERING TOOL

Robert C. Conerly, 622 Beulah Ave., Tylertown, Miss. 39667

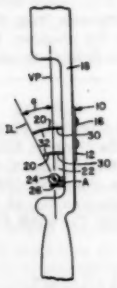
Filed Sep. 27, 1982, Ser. No. 424,871
Int. Cl.³ G01B *5/25*
U.S. Cl. 33—180 R **8 Claims**

1. A centering tool for centering a gem stone or the like on a dop stick end, said tool including a support defining abutment surface means from which one end portion of the dop stick may be supported in position paralleling a predetermined axis against lateral displacement in any direction and for axial shifting relative to said support as desired, said support defin-

ing at least three mounting locations spaced about said axis and generally disposed in a plane normal to said axis and spaced therealong from said abutment surface means, an elongated measuring member supported from each of said mounting locations and extending substantially along a corresponding radius of said predetermined axis, said measuring members each being supported from the corresponding mounting location for adjustable shifting along the corresponding radius, said measuring members comprising micrometer assemblies including spindle, mounting sleeve and thimble portions, said mounting sleeve portions being supported from said mounting location for adjustable shifting along the corresponding radii of said predetermined axes, said micrometer assemblies each including zero settings.



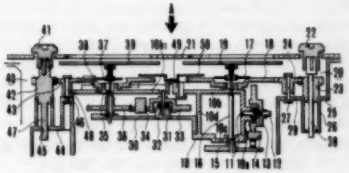
4,426,787
BOW SIGHT
James C. Hayes, 9190 Victory Hwy., Painted Post, N.Y. 14870
Filed Jul. 12, 1982, Ser. No. 397,678
Int. Cl.³ F41G *1/46*
U.S. Cl. 33—265 **10 Claims**



2. An archery bow sight adapted to be mounted on a conventional bow comprising, means for mounting the bow sight on a bow, sighting means extending from said mounting means in a fixed predetermined orientation with respect thereto, said sighting means having a linear portion adjacent said mounting means and a curvilinear portion extending outwardly from said linear portion, said curvilinear portion having a constant curvature about an axis lying within a plane intersecting the intersection between said curvilinear portion and said linear portion of said sighting means, said curvilinear portion terminating in an end portion such that a line passing therethrough and intersecting said axis forms a predetermined angle with said plane, said sighting means including a plurality of spaced-apart linear portions extending from said mounting means, and each of said linear portions having a curvilinear portion extending outwardly therefrom and describing segments of concentric circles about said axis.

5. An archery bow sight adapted to be mounted on a conventional bow comprising, bracket means for mounting the bow sight on a bow, sighting means extending from said bracket means for projecting within a sight window of a bow in a fixed predetermined orientation with respect thereto, said sighting means including a plurality of curvilinear sighting pins, each said sighting pin having a constant curvature about a common axis and formed with a radius equal to its distance from said common axis, and said sighting pins forming a plurality of segments of concentric circles about said common axis.

4,426,788
INCLINOMETERS
Hisashi Hirose; Hiroshi Arai, both of Toyota; Hiroshi Iiyama, Yokosuka, and Hirokazu Komiya, Tokyo, all of Japan, assignors to Toyota Jidosha Kabushiki Kaisha and Jeco Co., Ltd., both of, Japan
Filed Feb. 24, 1983, Ser. No. 469,380
Claims priority, application Japan, Feb. 26, 1982, 57-27016[U]
Int. Cl.³ G01C *9/16*
U.S. Cl. 33—395 **3 Claims**



1. In an inclinometer of the type wherein a weight rotatable in accordance with an inclination of a vehicle on which the inclinometer is mounted is provided for a drive unit, and a torque of said drive unit is transmitted to a driven unit so as to display an inclination angle of said vehicle with an inclination indicator fixed to a shaft of said driven unit, the improvement which comprises a zero point adjusting spiral spring, means for securing an inner end of said spring to a shaft of said driven unit, means for securing an outer end of said spring to a rotary drive member, and a zero point adjusting knob for rotating said rotary drive member.

4,426,789
NAVIGATION POSITION PLOTTER
Lloyd P. Goodrich, 3929 Woodhall, Detroit, Mich. 48224
Filed Dec. 10, 1982, Ser. No. 448,800
Int. Cl.³ B43L *13/02*; G01C *21/20*
U.S. Cl. 33—431 **12 Claims**

1. A navigation position plotter for use with a navigation chart bearing spaced navigation grid lines comprising:

a frame;

a plate mounted on the frame;

a scale formed on the plate having designations corresponding to incremental graduations between two adjacent grid lines on a navigation chart;

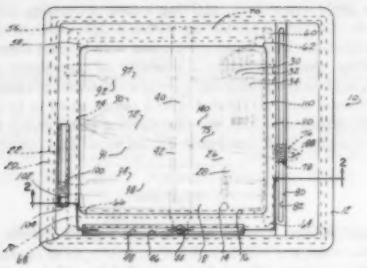
a first plotting bar slidingly mounted on the frame for movement across the frame; a first plot line formed on the first plotting bar;

a second plotting bar pivotally mounted on the frame at one end and movably intersecting the first plotting bar;

a second plot line formed on the second plotting bar a portion of the second plot line overlying the navigation scale on the plate; and

means, carried by the frame, for positioning the frame over a navigation chart with respect to the position to be plotted such that the scale increments of the position to be

plotted between two adjacent grid lines on the navigation chart underlie the second grid line when the first and



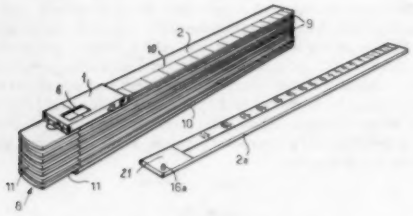
second plot lines are disposed in intersecting relationship over the point to be plotted.

4,426,790

FOLDING RULER ACCESSORY

Eugene Kimel, 24, Rte. de la Reine, 92100 Boulogne, France

Filed Jul. 20, 1981, Ser. No. 284,682
Claims priority, application France, Jul. 21, 1980, 80 16013
Int. Cl.³ G01B *3/06, 3/08*
U.S. Cl. 33—458 **17 Claims**



1. A foldable ruler which comprises two outer sections and at least one intermediate section, each of said sections having two ends, and adjacent sections being connected by hinges which are spaced from a free end of said adjacent sections, said hinges being located along two axes, each outer ruler section having a free end substantially coincident with one of said axes, in combination with an accessory comprising:

(a) a small bar having indicia thereon;

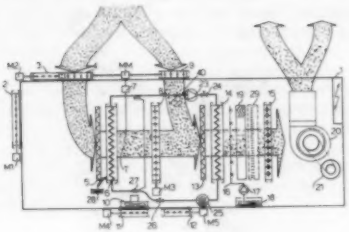
(b) a sheath adapted to be attached to one of said outer ruler sections, said sheath including two ends and an upper passageway in which said small bar is adapted to be slidably mounted, a window opening to permit reading of said indicia on said bar, and a hairline index positioned adjacent to said window said hairline index being offset from one end of said sheath by a distance which is equal to the distance separating each hinge axis from the associated free end of one of said intermediate ruler sections, wherein said sheath can be mounted on one outer ruler section so that one end of said sheath will coincide with said free end of said one outer ruler section, said free end of said outer ruler section comprising a reference position.

4,426,791

PROCESS AND SYSTEM FOR DRYING PRODUCTS AND MATERIALS, SUCH AS WOOD

Ivo Coppa, Via Toniolo, 20030 Seveso (Milan), Italy

Filed Feb. 9, 1981, Ser. No. 232,712
Claims priority, application Italy, Sep. 5, 1980, 24481 A/80
Int. Cl.³ F26B *3/04, 21/08*
U.S. Cl. 34—27 **2 Claims**



1. A process for the drying of wood and other materials using a heat pump cycle including a compressor, an evaporator and a condenser, comprising:

placing the material in a chamber;

selectively withdrawing air from the chamber, from the outside, or from both the chamber and the outside,

passing the air through the evaporator to remove heat from the air;

selectively returning the air to the chamber or discharging the air to the outside, depending on the properties of the air after it has passed through the evaporator;

passing the air to be returned to the chamber through the condenser prior to returning the air to the chamber;

withdrawing additional air from the chamber;

passing the additional air directly through the condenser;

controlling the ratio of air passed through the evaporator to additional air passed directly through the condenser in response to the properties of the air passed through the evaporator after it has passed through the evaporator; and

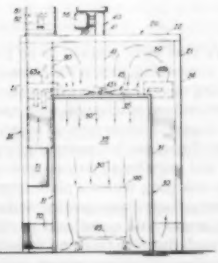
mixing the air withdrawn from the outside with the air withdrawn from the chamber, before the air from the chamber is passed through the evaporator.

4,426,792

HIGH TURBULANCE HEAT TRANSFER OVEN

Willie H. Best, 18C The Heritage, Columbia, S.C. 29201

Division of Ser. No. 916,214, Jun. 16, 1978, Pat. No. 4,235,023, and a continuation of Ser. No. 104,339, Dec. 17, 1979, abandoned. This application Jul. 13, 1981, Ser. No. 282,531
Int. Cl.³ F26B *3/04*
U.S. Cl. 34—28 **17 Claims**



1. An oven for drying objects passed along a prescribed path therethrough, comprising:

(a) A housing having an entrance and exit and an open interior therebetween for forming a continuous path of travel through which successive objects to be dried are passed along said prescribed path from the entrance to the exit;

(b) a plurality of fans disposed successively along the length of said path, each of said fans having a hub and circumferentially spaced radial blades extending from said hub for rotating to generate a circulation of air, said blades being disposed generally in planes approximately parallel to and adjacent to said prescribed path, said fans being spaced from the walls and spaced from each other, said fans being disposed so as to circulate air in a circular flow of air over a portion of said path, the flow of air being from one side of the fan around to the other side of such fan, the spacing of said fans being such that air flows from successive fans respectively to impinge on objects at successive locations along said path of travel.

(c) heating means for delivering heat to the circulated air as it is directed in its path so that the air is progressively heated before being delivered toward said path of travel.

4,426,793

HEAT GENERATING APPARATUS AND ITS PROCESS UTILIZING AIR CIRCULATION AND CONVECTION

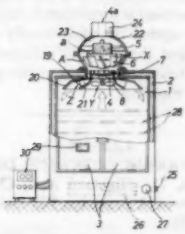
Nobuyoshi Kuboyama, 28-9-1, Shimomiyamori, Aza, Miyamori-Mura, Iwate-Ken, Japan

Filed Feb. 16, 1982, Ser. No. 349,064

Claims priority, application Japan, Feb. 19, 1981, 56-22171; Feb. 23, 1981, 56-24216

Int. Cl.³ F26B *23/00*

U.S. Cl. 34—15 **6 Claims**



1. A heat generating apparatus utilizing air circulation and convection, comprising:

a chamber including an air outlet;

an air suction opening in said air outlet of said chamber;

rotary means mounted in said air suction opening effective to reduce air pressure in said chamber to a reduced balanced level by forcibly suctioning air from said chamber and discharging said air outside said sealed chamber;

an air friction heat generating means in a rotation area of the rotary means, said air friction heat generating means being effective to add heat to air remaining in said chamber;

means for maintaining said air pressure in said chamber at said reduced balanced level whereby air remaining in the interior of said chamber is heated by air friction heat at said reduced balanced air pressure;

said means for maintaining including means for controlling a flow rate of air entering said chamber to a value effective to maintain a temperature of air remaining in said chamber at a predetermined level;

trailing rotary means opposing to said rotary means of said air friction heat generating means; and

guide means effective in cooperation with said trailing rotary means for causing forcible air circulation and convection.

4,426,794

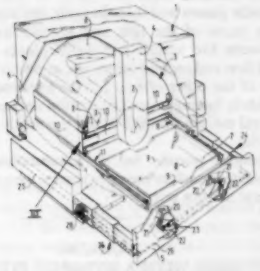
APPARATUS FOR HANDLING LAUNDRY

Herman E. C. Vanderheijden, Aalter, Belgium, assignor to E. M. D'Hooge N.V., Ledeberg, Belgium

Filed Nov. 2, 1981, Ser. No. 317,556

Int. Cl.³ F26B *11/04*

U.S. Cl. 34—109 **19 Claims**



1. A laundry device comprising a housing having upper and lower door openings and upper and lower doors; a drum assembly disposed within said housing and comprising diametrically opposed perforate drum sections, a horizontal shaft extending axially of the drum assembly and means carried by said shaft for slidably supporting each drum section and for isolating said drum sections from each other whereby each drum section forms, with such means, a separate compartment for containing laundry material; said upper and lower door openings being respectively above and below the axis of the drum assembly so that any drum section may be emptied by gravity by rotating the drum assembly to a position in which a particular drum section is uppermost and then sliding such drum section outwardly through said upper door opening, whereafter the particular drum sectiion may be loaded by sliding such drum section back into place, rotating the drum assembly so that the particular drum section is lowermost and then sliding such drum section outwardly through said lower door opening.

4,426,795

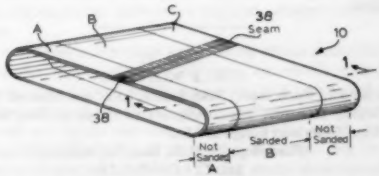
DRYER FELT FABRIC AND DRYER BELT

Robert J. Rudt, East Greenbush, N.Y., assignor to Albany International Corp., Albany, N.Y.

Filed Jul. 31, 1981, Ser. No. 288,973

Int. Cl.³ F26B *13/08*

U.S. Cl. 34—116 **8 Claims**



1. A fabric for use as a paper machine dryer felt, which comprises;

a first sinuous layer of cross-machine direction yarns, providing a fabric first periphery of peaks and valleys wherein a plurality of peaks are in a first outside plane and the valley floors are in a first inside plane, said peaks being of a character which provide about 20 to 50 percent of the surface area of the first periphery and 100 percent of the

area which will come in contact with the paper sheet to be supported by the felt on a paper machine;

a second sinuous layer of cross-machine direction yarns, providing a fabric second periphery of peaks and valleys wherein a plurality of peaks are in a second outside plane and the valley floors are in a second inside plane;

a plurality of machine direction yarns positioned between the first and second outside planes and interweaving the cross-machine direction yarns of the first and second outside planes and interweaving the cross-machine direction yarns of the first and second layers at the points between the outside and inside planes of at least one of said first and second layers and at points within the periphery of the other of said first and second layers;

said fabric having a central portion defined and bounded by lateral margin portions along the machine direction of the fabric;

said central portion having a substantially greater sheet contacting surface area per square meter than found in the lateral margin portions.

4,426,796

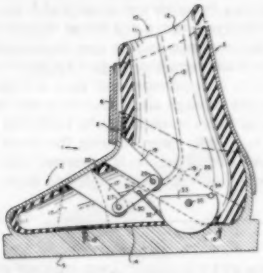
SPORT SHOE WITH A DYNAMIC FITTING SYSTEM

Richard G. Spademan, P.O. Box 6410, Incline Village, Nev. 89450

Continuation-in-part of Ser. No. 109,611, Jan. 4, 1980, and Ser. No. 104,283, Dec. 17, 1979, and Ser. No. 104,282, Dec. 17, 1979, and Ser. No. 50,436, Jun. 20, 1979, and Ser. No. 886,946, Mar. 15, 1978. This application Jan. 22, 1981, Ser. No. 227,393

Int. Cl.³ A43B *5/04*

U.S. Cl. 36—119 **60 Claims**



1. A sport shoe for a lower extremity comprising fitting means for providing a close fit between the shoe and the lower extremity; tightening means responsive to a predetermined movement of the wearer of the shoe for momentarily increasing the tightness of the close fit established by the fitting means; and means for preventing a loosening of the fitting means.

4,426,797

SHELF MOLDING

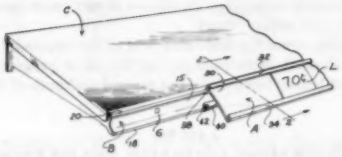
Richard L. Burkemper, Manchester, Mo., and Manuel F. Tambrella, Houston, Tex., assignors to Creative Data Services, Inc., Maryland Heights, Mo.

Filed Sep. 27, 1982, Ser. No. 424,622

Int. Cl.³ G09F *3/18*

U.S. Cl. 40—16.4 **9 Claims**

1. In combination with a shelf to which an attached shelf molding is fastened, the shelf molding having a generally upright backing surface, a downwardly turned lip located along the upper margin of the backing surface and spaced forwardly from that surface, and an upwardly turned lip located along the lower margin of the backing surface and likewise spaced forwardly from that surface, the lips forming grooves along the upper and lower margins of the backing surface for retaining shelf labels against the backing surface; a supplemental shelf molding fitted to the attached shelf molding for displaying labels at an inclination different from that afforded by the attached molding, said supplemental shelf molding comprising: a display panel; means along the display panel for holding a shelf label against the display panel; an upper retaining rib extending rearwardly from the display panel and located beneath the downwardly turned lip at the upper margin of the attached molding; a positioning web extended rearwardly from the display panel below the upper retaining rib and passing beneath the upwardly turned lip on the attached molding; a lower retaining rib projecting upwardly from the positioning web and being located generally in front of the upwardly turned lip of the attached molding, the lower retaining rib having a laterally directed segment which overlies the upwardly directed lip on the attached molding; and a backing flange also projected upwardly from the positioning web and located rearwardly from the lower retaining rib and behind the lower portion of the attached shelf molding, whereby a groove exists between the lower retaining rib and the backing flange, with the groove being wide enough to receive the lower portion of the attached shelf molding; the supplemental shelf molding between its upper and lower retaining ribs being deflected within the elastic limits of the material from which the supplemental molding is formed such that the upper retaining rib bears snugly against the downwardly directed lip of the attached molding and the laterally directed segment of the lower retaining rib bears snugly against the upwardly directed lip on the attached molding.



4,426,798

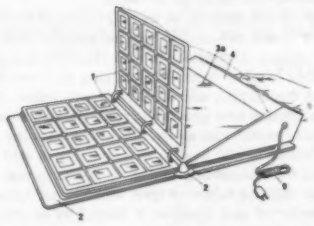
TRANSPARENCY VIEWING DEVICE

Carter A. Saunders, 714 Highland Ave., Charlottesville, Va. 22903, and Sherwood S. Brownlee, 905 Oak Ave. Ext., Waynesboro, Va. 22980

Filed Apr. 8, 1981, Ser. No. 249,601

Int. Cl.³ G02B *27/02*

U.S. Cl. 40—361 **3 Claims**



1. An apparatus for viewing pages of transparencies in a loose-leaf book and for sorting individual transparencies, comprising:

a housing which is generally wedge shaped in cross section, said housing have three sides and a top and bottom translucent viewing surface, said top surface being generally smooth for viewing said pages containing at least one of said transparencies, said bottom surface having spaced transverse ribs extending between two of said sides for

permitting mounting, viewing and sorting of said individual transparencies;

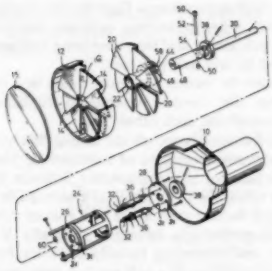
a hinged double sided reflector surface which is mounted on said housing where said top and bottom surfaces meet for pivotal movement between said surfaces; an internal light source for illuminating said top and bottom viewing surfaces; said apparatus being adaptable for use in a first position in which said smooth surface is inserted under a said page of transparencies for viewing, and a second position in which the ribbed surface faces up for viewing, sorting and mounting said individual transparencies, whereby said reflector surface pivots between the top and bottom surfaces as the apparatus is moved between said first and second positions.

4,426,799

VANE OPERATED DISPLAY OR INDICATING DEVICE

Donald Winrow, Weston, Canada, assignor to Nei Canada Limited, Toronto, Canada

Filed Jun. 21, 1982, Ser. No. 390,311
Int. Cl.³ G09F *9/00*
U.S. Cl. 40—449 **8 Claims**



1. Display or indicator element defining a viewing direction comprising:

a first set of vanes together encompassing a first predetermined area in the viewing direction,

each of said vanes defining a substantially equal angle,

said vanes conforming approximately to the locus of a line perpendicular to an axis extending in said viewing direction with each point on the line describing an approximate helix relative to said axis,

said vanes being so shaped and arranged that a similar set of vanes may be rotated in one sense and axially advanced and rotated in the opposite sense and axially retracted relative to the first between a first position where said similar set of vanes is occluded by the first in the viewing direction and a second position where said second set of vanes occludes the first in the viewing direction,

a similar set of movable vanes mounted to so move between said first and second positions,

stop means designed to stop movement of said similar set of vanes at said first and said second positions, a guide connection between a member movable with said similar vanes and a stationary member for causing said similar vanes to be so axially advanced and retracted on rotation in one and in the opposite direction of said similar vanes,

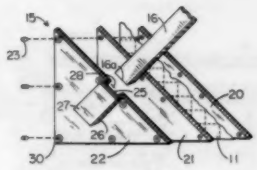
means for moving said similar set of vanes between said two positions.

4,426,800

FLEXIBLE SIGN WITH IMPROVED CORNER BRACKET

Herman O. Brown, 110 Cedar Ct., Marietta, Ga. 30067

Filed Apr. 30, 1982, Ser. No. 373,656
Int. Cl.³ G09F *7/02, 17/00*
U.S. Cl. 40—606 **5 Claims**



3. The sign as in claim 1, wherein:

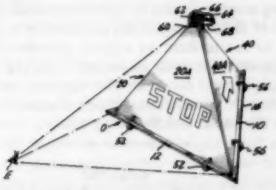
said receptacle defining means is spaced outwardly from said back side, so that the frame member end removably fits in fixed engagement within the receptacle and is there maintained spaced apart from the flexible panel by said rigid back portion.

4,426,801

COLLAPSIBLE DISPLAY SIGN ASSEMBLY

Frank M. Gates, Rte. 5, Box 2250, Ellensburg, Wash. 98926

Filed Sep. 16, 1982, Ser. No. 418,759
Int. Cl.³ G09F *15/00*
U.S. Cl. 40—606 **7 Claims**



1. A message display assembly for traffic control or the like, comprising three separable, triangularly shaped panels, each having large message displays on both sides thereof,

readily separable panel apex joining means interconnecting the apexes of said panels,

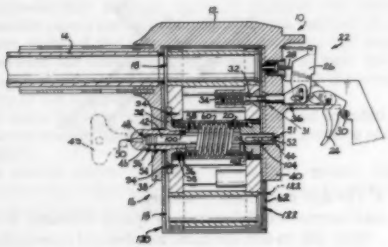
readily separable panel side joining means connecting the respective sides of said panels opposite the apexes thereof to the respective sides of a triangularly shaped base member,

the readily separable panel apex joining means interconnecting the apexes of said panels and the readily separable panel side joining means connecting said panels and said base member providing, of themselves, in conjunction with said panels and base member, a stable tetrahedronal assembly for display of the messages on one side or the other of said panels with the joining means at the apexes of the panels intereconnected, and providing for ready reversibility of the panels to display the messages on the other sides of said panels by disconnection of the panel apex joining means at one side of said base member and reconnection thereof at the other side of said base member, the said readily separable joining means further enabling ready interchangeability and substitution of other message display panels for any given message display panel.

4,426,802
FIREARM

Hilton R. Walker, Kloof, South Africa, assignor to Industrial Units (Proprietary) Limited, Kloof, South Africa

Filed Sep. 18, 1981, Ser. No. 303,680
Int. Cl.³ F41C *1/00*
U.S. Cl. 42—59 16 Claims

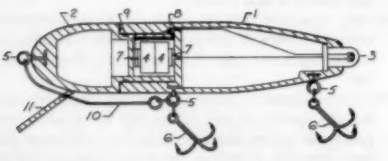


1. A fire arm comprising
a frame;
a barrel leading from the frame;
a cartridge firing mechanism biassed to an uncocked position and including a trigger and firing pin, the mechanism being operatively mounted in the frame and adapted to be operated to fire a cartridge;
a rotary magazine having a plurality of circumferentially spaced cartridge chambers and being rotatable relative to the frame discretely to align the chambers with the barrel and the firing pin;
a spring motor which is adapted, in use, to exert torque on the magazine relative to the frame, thereby to rotate the magazine; and
indexing means adapted to operate automatically after operation of the cartridge firing mechanism to allow the magazine to rotate from an aligned position in which a cartridge chamber is in alignment with the barrel and the firing pin, and to arrest the magazine in a non-aligned position in which no cartridge chamber is in alignment with the barrel and the firing pin.

4,426,803
ILLUMINATED FISHING LURE

Danie W. Helling, 516 W. 3rd St., Washington, Mo. 63090

Filed Sep. 1, 1982, Ser. No. 413,715
Int. Cl.³ A01K *85/00*
U.S. Cl. 43—17.6 8 Claims

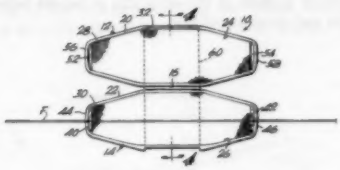


1. A light emitting fishing lure comprising a body, said body comprising at least a first and second section slidably interfitted with one another, one of said sections supporting a battery and the other section supporting a light means, lead means providing an electrical circuit extending between said battery and light means, switch means to open and close said circuit operable to relative sliding movement between said first and second sections to open and close said lead means, said second section being provided with fish hook members and said first section being provided with an eyelet for attachment to a fish line, said first section being moveable to a switch open position responsive to tension on the first section such as by pulling on the fish line when said second section is restrained as by a snagging of the fish hook member.

4,426,804
FISHING FLOAT

Duane Hutson, 1315 Country Club Prado, Coral Gables, Fla. 33134

Filed Jul. 6, 1981, Ser. No. 280,983
Int. Cl.³ A01K *93/00*
U.S. Cl. 43—44.91 8 Claims

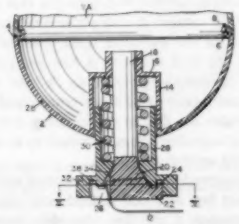


5. A fishing float for selective attachment to a fishing line comprising:
two half portions, each having outer shells defining therein cavities;
replaceable flotation means in the form of closed cell foam material disposed in the cavities;
hinge means connecting confronting edge portions of the outer shells comprising a flexible web portion of a piece of synthetic tape connecting between said half portions, a major portion of said tape overlying and being adhesively secured to said half portions;
latch means to secure the outer shells in a closed position wherein the cavities containing replaceable flotation means confront each other; and
means to frictionally secure the fishing line between the two half portions comprised of substantially planar confronting surfaces of said replaceable flotation means of each cavity when the outer shells are secured in a closed position, and further comprised of a pair of substantially planar slit projections having a generally V-shaped outer lead-in and extending radially outward from respective opposed portions of a half portion positioned inwardly of respective end walls thereof.

4,426,805
LINE CLAMP FOR FISHING FLOAT

John T. Riead, Cameron, Mo., assignor to Ricadco Corporation, Cameron, Mo.

Filed Sep. 3, 1982, Ser. No. 414,883
Int. Cl.³ A01K *93/00*
U.S. Cl. 43—44.95 3 Claims



1. A line clamp for a fishing float having a buoyant body member, said clamp comprising:
a. an elongated stem fixed at one end in said body member and

projecting outwardly therefrom, the outer end portion of said stem being taperingly enlarged to present a conical first clamping surface confronting said body member,

b. a plunger mounted for sliding movement on said stem intermediate said body member and said first clamping surface, the outer end of said plunger being formed to present a hollow, conical second clamping surface capable of mating with said first clamping surface when said plunger is moved outwardly along said stem, and

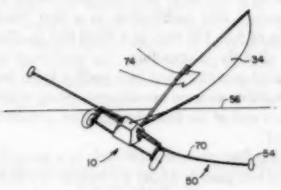
c. a spring biasing said plunger outwardly along said stem, said plunger being manually retractable against said spring to separate said first and second clamping surfaces to permit looping of a fishing line around said stem intermediate said surfaces, whereby said line loop is clamped between said surfaces when said plunger is released, the outer end of said stem at the outer end of the conical clamping surface thereof, having a notch formed radially inwardly from its periphery to such a depth that its base, which is generally parallel to the axis of the stem, intersects the conical clamping surface of said stem, said notch functioning to accomodate the reaches of said fishing line extending from said line loop between said clamping surfaces.

4,426,806

MODEL LANDSAILER

Lee M. Woodworth, R.F.D. 4, Long Pond Rd., Plymouth, Mass. 02360

Filed Oct. 26, 1981, Ser. No. 315,141
Int. Cl.³ A63H *30/04*; G09B *9/06*
U.S. Cl. 46—248 **10 Claims**



1. A remotely controlled unattended land sailer, comprising:

a wheeled vehicle having a body at least one sail, a mast mounted to said body for supporting said sail, a boom pivotally mounted to said mast, a sheet attached at one end to said body and at its other end to said boom for maintaining said sail at a predetermined sail set to either side of the centerline of said vehicle;

said vehicle having a single forward wheel and remotely controlled steering means for turning said wheel responsive to remote control signals;

said vehicle having means for providing realistic heeling including a flexible outrigger mounted to said vehicle along a single axis transverse to the centerline of said vehicle for flexing in a plurality of planes, said outrigger having portions extending from either side of said vehicle, said outrigger portions comprising a flexible wire, said vehicle having a pair of wheels being in fixed spaced-apart relation attached respectively to the free ends of said outrigger portions;

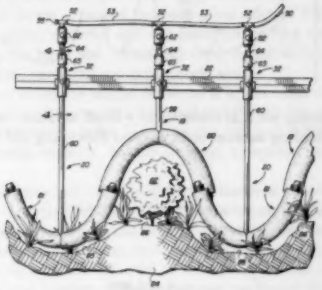
said wire being of a stiffness to prevent turnover of said vehicle for winds under a predetermined maximum and being of a stiffness to provide said vehicle with an amount of heel which causes said vehicle to approximate the sailing characteristics of waterborne sailboats during a tacking maneuver.

4,426,807

HERBICIDE APPLICATOR FOR USE ON A VEHICLE

Mitchell E. Maddock, Rte. 1, Box 24AA, Florence, Ariz. 85232

Continuation-in-part of Ser. No. 198,664, Oct. 20, 1980, abandoned, which is a continuation-in-part of Ser. No. 78,654, Sep. 24, 1979, abandoned, which is a continuation-in-part of Ser. No. 72,147, Sep. 4, 1979, Pat. No. 4,305,224. This application Jun. 9, 1982, Ser. No. 386,634
Int. Cl.³ A01M *21/00*
U.S. Cl. 47—1.5 **23 Claims**



1. A liquid herbicide applicator mechanism for mounting on a farming vehicle to wipingly apply the herbicide on undesired vegetation growing in a cultivated field as the vehicle moves therethrough, said herbicide applicator mechanism comprising:

(a) tool bar means mountable on the farming vehicle so as to be in upwardly spaced relationship with respect to the cultivated field in which it is to be used;

(b) reservoir means for containing a supply of the liquid herbicide; and

(c) at least one herbicide dispenser assembly coupled to said tool bar means and coupled to receive herbicide from said reservoir means, said herbicide dispenser assembly having an elongated herbicide wiper head means for absorbing the received herbicide with said wiper head means disposed in overlaying relationship with respect to the cultivated field in which it is to be used for wipingly applying the absorbed herbicide on undesired vegetation growing therein, said herbicide wiper head means being substantially rigid but deformably configurable and being shaped into substantial conformity with the contour characteristics of the cultivated field.

4,426,808

METHOD OF NON-AGRICULTURAL PRODUCTION OF JOJOBA WAX

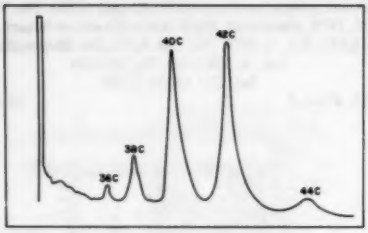
Jules Janick, West Lafayette, Ind., and Daniel C. Wright, Hornell, N.Y., assignors to Purdue Research Foundation, West Lafayette, Ind.

Continuation of Ser. No. 266,322, May 22, 1981, abandoned. This application Feb. 16, 1983, Ser. No. 466,877
Int. Cl.³ A01G *1/00*
U.S. Cl. 47—58 **4 Claims**

1. A non-agricultural method for the production of embryos of *Simmondsia chinensis* consisting of the steps of:

selection and excision of immature zygotic embryos of jojoba from immature jojoba fruits, said selection being made from the group of zygotic embryos excised aforesaid, and none being retained for proliferation in excess of one hundred milligrams by weight;

Proliferation of immature zygotic embryos of jojoba in a basal medium;



Growing asexual embryos in a basal medium; and

Harvesting asexual embryos and extracting the liquid wax.

4,426,809

REACTOR FOR GASIFYING SOLID FUELS

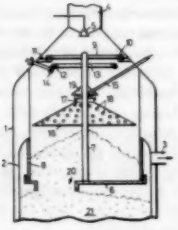
Hans Küpfer, Frankfurt am Main, and Paul Rudolph, Bad Homburg, both of Fed. Rep. of Germany, assignors to Metallgesellschaft Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Feb. 18, 1982, Ser. No. 349,875

Claims priority, application Fed. Rep. of Germany, Mar. 5, 1981, 3108213

Int. Cl.³ C10J *3/30*

U.S. Cl. 48—86 R **5 Claims**



1. In a reactor for gasifying solid fuels in a fixed bed with oxygen, steam, carbon dioxide or mixtures thereof as gasifying agents which reactor is provided with means for inserting said gasifying agent from a position below solid fuel therein to be gasified, means for withdrawing gasification residues under a fixed bed of solid fuel within said reactor as solid ash or liquid slag and means for charging the fixed bed of solid fuel with solid fuel to be gasified via a lock chamber and means for introducing tar to said solid fuel via a tar supply conduit, the improvement wherein below said tar supply conduit there is an inclined distributor surface having a plurality of openings, and on top of said distributor surface there is a tar tub having outlet openings, said tar tub being in fluid communication with said tar supply conduit, whereby when tar is supplied via said tar supply conduit to said tar tub it is caused to overflow said tar tub at a plurality of points, the tar from said tar tub flows onto said inclined distributor surface and said tar flowing on said distributor surface is divided into a plurality of individual streams flowing through the openings of said distributor surface.

4,426,810

PROCESS OF GASIFYING SOLID FUELS

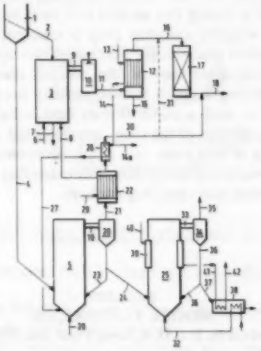
Paul Rudolph, Bad Homburg; Rainer Reimert, Idstein, and Osman Turna, Frankfurt am Main, all of Fed. Rep. of Germany, assignors to Metallgesellschaft Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Jan. 6, 1982, Ser. No. 337,345

Claims priority, application Fed. Rep. of Germany, Sep. 25, 1981, 3138124

Int. Cl.³ C10J *3/54*

U.S. Cl. 48—197 R **10 Claims**



1. A process of gasifying solid fuels with gasifying agents including steam and oxygen-containing gas by contacting said gasifying agents with a coarse-grained solid fuel in particle sizes of at least 2 mm so as to effect gasification comprising

(a) conducting said gasification in a first reactor under a pressure of 5 to 150 bars in a fixed bed gasifier while said bed is slightly descending, the gasifying agents being introduced into the fixed bed gasifier from below and the incombustible mineral constituents being withdrawn from the lower end of the fixed bed gasifier as solid ash or liquid slag, and

(b) gasifying fine-grained solid fuels in a second reactor in a fluidized bed gasifier under a pressure of 1 to 100 bars, said second reactor being separated from said first reactor, the product gas formed in the second reactor and having a temperature of 700° to 1200° C. being indirectly cooled with water to convert said water to steam, said steam being supplied as a gasifying agent to the first reactor and the product gas from the first reactor being indirectly cooled with water whereby to convert said water to steam and at least part of the resulting steam being supplied as a gasifying agent to the second reactor.

4,426,811

METHOD OF AND APPARATUS FOR GRINDING THE EDGES OF GLASS SHEETS

Rudolf Eckardt, and Hans-Cristoph Neuendorf, both of Wesel, Fed. Rep. of Germany, assignors to Flachglass Aktiengesellschaft, Gelsenkirchen, Fed. Rep. of Germany

Filed Sep. 18, 1981, Ser. No. 303,625

Claims priority, application Fed. Rep. of Germany, Sep. 20, 1980, 3035553

Int. Cl.³ B24B *9/10, 17/02*

U.S. Cl. 51—101 R **6 Claims**

1. An apparatus for grinding the edges of similar glass sheets whose edges are polygons that are not symmetrical about a point, said apparatus comprising:

a supply station supporting a stack of such sheets with all of the sheets in the stack in vertical registration;

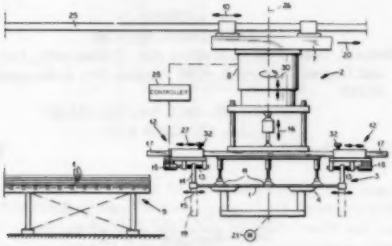
a grinding table at a grinding station adjacent said supply

station and rotatable about an upright grinding axis for supporting said sheets during grinding,

a template secured to and jointly rotatable with said grinding table;

means including a pair of grinders in said grinding station radially oppositely engageable with the edges of a sheet on said grinding table and radially displaceable by said template;

means including a transporter for transporting said sheets one at a time from said stack in said supply station to said grinding station, said transporter including a glass sheet holder rotatable about a vertical intermediate axis and



means for rotating said holder through 180° about said intermediate axis;

means for simultaneously engaging said grinders with the sheet in said grinding station while rotating said grinding table with said template and the sheet on said table through 180° to grind the edges of the sheet on said table, whereby each such grinding operation displaces said template through 180° about said grinding axis;

means for rotating every other sheet while transporting same from said supply station to said grinding station through 180° about said intermediate vertical axis; and

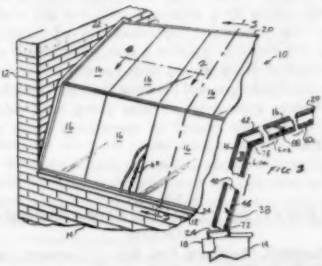
means for positioning said sheet on said holder with respect to said intermediate axis.

4,426,812

INTERIOR COVERING MATERIAL FOR A GREENHOUSE

Keith A. Pochter, Glencoe, Ill., assignor to Argyle Management Company, Northbrook, Ill.

Filed Jun. 25, 1981, Ser. No. 277,070
Int. Cl.³ E04B 7/00
U.S. Cl. 52—22 **18 Claims**



1. For use in a greenhouse enclosure in which there are a plurality of vertically aligned mullions extending from a sill to a head, each mullion including a standard having two margins, on one margin the mullions carrying panels of exterior covering material which is at least translucent, and on the other margin each mullion including two spaced apart and oppositely extending flanges which are substantially parallel to the panels of exterior covering material, wherein the invention comprises:

at least one panel of flexible, interior covering material which is at least translucent, the panel having a width less than the distance between the standards but greater than the distance between the flanges of adjacent mullions, the panel having a length less than the distance from the sill to the head and having a thickness less than the distance from the panels of exterior covering material to the flanges, and the panel being flexed and inserted between adjacent mullions and resting on the flanges on sides thereof adjacent the panels of exterior covering material;

upper bead means arranged between a top edge of the interior covering material and the head for sealing the top edge to the head and furnishing dimensional stability to the interior covering material panel; and

lower bead means arranged between a lower edge of the panel of interior covering material and the sill for sealing the lower edge of the panel to the sill and furnishing dimensional stability to the interior covering material panel;

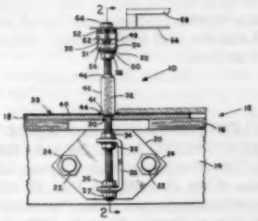
so that the panel of interior covering material provides a second covering formation for the enclosure and so that the panels of exterior and interior covering material and the standards of adjacent mullions form a closed space and insulate against the transfer of energy from and to the exterior and interior of the greenhouse enclosure through the panels of covering material.

4,426,813

APPARATUS FOR MOUNTING ELEMENTS ON A SLATE, CEDAR SHAKE OR SHINGLED ROOF

John L. Buzzi, Jr., 169 Maple Ave., Metuchen, N.J. 08840

Filed Jul. 26, 1982, Ser. No. 402,141
Int. Cl.³ E04F 19/00
U.S. Cl. 52—27 **11 Claims**



1. An apparatus for mounting elements on a roof, said elements having a mounting assembly and said roof being formed by a plurality of beam supports wherein are mounted a plurality of spaced transverse roof supports having a fixably attached roof covering thereon, said roof covering having a plurality of bores therethrough, comprising:

(a) a sleeve member positioned on said roof covering and formed by a plate member having an opening therein and a tubular collar member affixed to said plate member in axial alignment with said opening in said plate member thereby forming a duct, said duct positioned in axial alignment with said bore in said roof covering;

(b) a mounting member positioned on said beam supports, said mounting member having an attachment member in axial alignment with said bore in said roof covering and said duct formed in said sleeve member; and

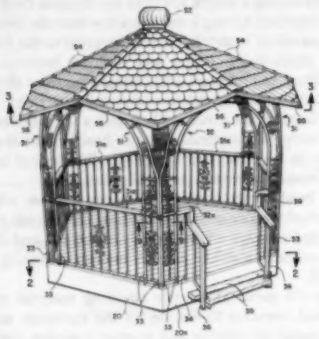
(c) a rod member engaged to said attachment member on said mounting member and disposed upwardly through said bore in said roof covering and said duct formed in said sleeve member in coaxial alignment and fixably engagable with said mounting assembly of said element.

4,426,814

PREFABRICATED GAZEBO

Adolf Stuhmer, 4680 Nambe Way,, Murray, Utah 84107

Filed Oct. 26, 1981, Ser. No. 315,352
Int. Cl.³ E04B *7/06, 7/10*
U.S. Cl. 52—82 **10 Claims**



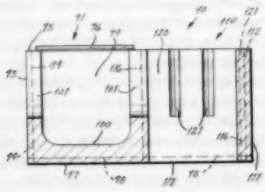
1. A prefabricated gazebo, comprising a floor assembly including a plurality of lengths of support material secured together in polygonal formation, deck support means secured to said polygonal formation, and deck means secured to said deck support means; a wall assembly including wall sections, each having an arch formation and being secured to a length of said support material, one of said wall sections serving as an entrance to the gazebo, each of said wall sections being secured to adjacent wall sections; and a roof assembly including a plurality of roof sections secured one to another and each to a wall section, each of said roof sections having a frame including a longitudinal central member having one end secured to the center of a partially circular plate, a pair of radial frame members extending outwardly from said partially circular plate, one on each side of said central member, and a pair of support frame members securing said radial frame members to said central member, and roofing means secured to the frames of said roof sections.

4,426,815

MORTARLESS CONCRETE BLOCK SYSTEM HAVING REINFORCING BOND BEAM COURSES

Sam Brown, 7564 Wellington Way, Clayton, Mo. 63105

Continuation of Ser. No. 101,484, Dec. 10, 1979, abandoned, which is a continuation-in-part of Ser. No. 912,520, Jun. 5, 1978, abandoned. This application Nov. 10, 1980, Ser. No. 205,234
Int. Cl.³ E04B *1/00*
U.S. Cl. 52—100 **19 Claims**



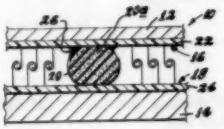
1. A wall course having first and second sections extending from each other, each section comprising a plurality of first blocks, each first block having side and end walls with one end wall provided with spaced parallel narrow vertical ribs and an opposite end wall provided with correspondingly spaced parallel narrow vertical grooves, and the wall course having an intersection block adapted to connect the first and second sections to enable them to extend at an angle to each other; the intersection block having rectangular end walls and side walls extending from top to bottom of the block, with parallel narrow vertical grooves in its rectangular end walls inwardly from the edges thereof, and in each side wall, that are spaced to receive the ribs on the first blocks, whereby the same intersection block may provide for the second wall portion to extend in line with, to the right, or to the left from the intersection block, or to all of them, and wherein the parts of the end of side walls that are not engaged by another wall section extend from top to bottom and side to side of the block, with the narrow grooves exposed.

4,426,816

FASTENING MEANS

James C. Dean, 2154 N. Wallace Ave., Indianapolis, Ind. 46218, and Eugene R. Barnett, 6268 Windsor Dr., Indianapolis, Ind. 46219

Filed Aug. 20, 1981, Ser. No. 294,467
Int. Cl.³ E06B *3/26*
U.S. Cl. 52—202 **1 Claim**



1. A fastening means for releasably interconnecting a first panel member to a second panel member,

the fastening means comprising a Velcro type strip on one of the panel members and a co-operating Velcro type strip on the other of the panel members,

there being a sealing strip carried between the panel members adjacent the Velcro type strip and the co-operating Velcro type strip,

the sealing strip being of such a cross-sectional size and configuration, in comparison to the height of the Velcro type strips, that the operative meshing of the Velcro strip and the co-operating Velcro type strip is operative to cause a seal between the panel members,

in a combination in which there are Velcro type strip portions and co-operating Velcro type strip portions adjacent and along both sides of the sealing strip although not over the sealing strip,

the operative meshing of the Velcro type strip portions and co-operating Velcro type strip portions along both sides of the sealing strip although not over the sealing strip being thus operative, independently of rigidity of the panel members, to achieve a compression and a resilient deformation of the sealing strip, thereby better assuring an operatively airtight seal between the panel members when the Velcro type strip portions along both sides of the sealing strip are caused to operatively mesh with one another.

4,426,817

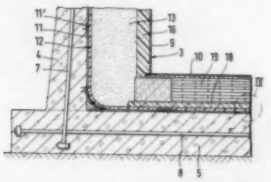
DOUBLE-WALLED TANK FOR LOW-TEMPERATURE LIQUIDS

Helmut Bomhard, Starnberg, Fed. Rep. of Germany, assignor to Dyckerhoff & Widmann Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Sep. 5, 1980, Ser. No. 184,484
Claims priority, application Fed. Rep. of Germany, Sep. 8, 1979, 2936420
Int. Cl.³ E04B *1/66, 1/74*
U.S. Cl. 52—262 **6 Claims**

1. A double-walled tank for low-temperature liquids, such as

liquid gas, comprising an inner tank forming a primary safety casing and an outer tank enclosing said inner tank and forming a secondary safety casing, said outer tank being constructed of reinforced concrete, a ceiling extending across the upper end of said outer rank and forming a closure for the upper end of the double-walled tank, a layer of thermal insulation located between said inner and outer tanks, a vapor-tight layer covering the inside surface of said outer tank, wherein the improvement comprises that said outer tank comprises a generally horizontally arranged base and an upwardly extending side



wall extending between said base and said ceiling, said vapor-tight layer being in direct surface contact with the entire inside surface of said outer tank including said side walls and said base, and said layer of thermal insulation comprising a liquid-tight first layer of polyurethane foam disposed in surface contact with and completely covering the inside surfaces of said vapor-tight layer and forming in combination with said vapor-tight layer a continuous and complete covering on the inside surfaces of said side wall and said base of said outer tank and said first layer of polyurethane foam being joint free throughout its extent in contact with said vapor-tight layer.

4,426,818

HEAT-INSULATING PANEL

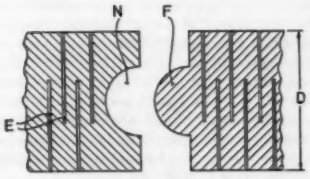
Benno Hoffmann, Ludwigshafen, Fed. Rep. of Germany, assignor to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Nov. 6, 1980, Ser. No. 204,636

Claims priority, application Fed. Rep. of Germany, Dec. 17, 1979, 7935446[U]

Int. Cl.³ E04B *1/62*

U.S. Cl. 52—309.4 **5 Claims**



1. A modular assembly comprising a plurality of adjacent rows of rectangular heat-insulating panels of semirigid foam plastic, said rows being dimensioned for insertion, under endwise compression, between structural members, such as rafters, which extend lengthwise in parallel relationship to each other at varying mutual spacings,

each said panel being provided, for compressibility, on both sides with a plurality of incisions which run substantially at right angles to the principal plane of the panel and parallel to the end faces thereof, and, hence, parallel to said members, the spacings between incisions being less than the panel thickness and the depth of the incisions being greater than half of the panel thickness,

each said panel having at its end faces and at its side faces matching tongue and groove profiles which interlock the individual panels of said assembly both in the endwise direction and from row to row, and

portions of said panels, which have been trimmed off, from one or the other end of said assembly, adjacent the corresponding member, for fitting said panels under compression endwise between said members, being at least partially reused in other rows of said assembly.

4,426,819

THERMAL INSULATING SYSTEM PARTICULARLY ADAPTED FOR BUILDING CONSTRUCTION

Harrison G. Dyar, P.O. Box 185, Tampa, Fla. 33601

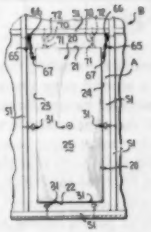
Division of Ser. No. 215,083, Dec. 10, 1980, Pat. No. 4,334,395.

This application May 3, 1982, Ser. No. 374,473

The portion of the term of this patent subsequent to Jun. 15, 1999, has been disclaimed.

Int. Cl.³ E04B *1/78*

U.S. Cl. 52—407 **6 Claims**



1. A system for insulating building walls, ceilings, floors or like structures comprising wall means for forming a hollow insulating panel defining an interior chamber under negative pressure, said panel having a plurality of upper and lower corners, means contacting a limited exterior surface area of said panel for supporting said panel in generally spaced relationship from an associated building wall, ceiling, floor or like structure, means normally spaced from the exterior surface of said panel for contacting a limited exterior surface area of said panel only upon said first-mentioned contacting means becoming inoperative which would in the absence of said second-mentioned contacting means result in direct contact between said panel and the associated building wall, ceiling, floor or like structure, said second-mentioned contacting means being an elongated pin-like element of relatively small cross-sectional configuration whereby thermal conduction transfer therethrough is substantially negligible, said first-mentioned means being a plurality of flexible connectors each defined by a plurality of interconnected links, and a flexible connector being disposed adjacent each of said upper corners.

4,426,820

PANEL FOR A COMPOSITE SURFACE AND A METHOD OF ASSEMBLING SAME

Heinz Terbrack, and Josef Terbrack, both of Ölbachstr. 50, 4426 Vreden, Fed. Rep. of Germany

Filed Feb. 17, 1981, Ser. No. 235,316

Claims priority, application Fed. Rep. of Germany, Apr. 24, 1979, 7911924; Oct. 9, 1979, 7928703

Int. Cl.³ E04C *1/10, 1/30*

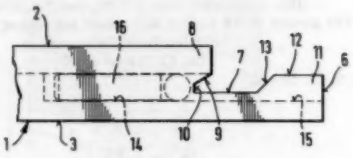
U.S. Cl. 52—594 **10 Claims**

1. A panel interconnectable with similar panels for forming a surface, the panel comprising:

means for forming opposite, conncted, first and second surfaces having edges, at least the first surface being planer, whereby the first surface forms upon interconnection of the panel with similar panels a section of the first-mentioned surface;

a first locking member extending from the second surface of

the panel along a first edge portion of the panel, the first locking member having a groove inwards of the first edge portion opening toward the first surface of the panel and terminating on its outer side therebelow, the groove having a planer base generally parallel to the first surface of the panel and inner and outer side walls generally angled similarly to the planer base, the inner side wall extending toward the outer side wall and having a portion which meets the planer base normally for forming, in combination with the planer base a truncated wedge space, the angle of the inner side wall to the planer base being smaller than that of the outer side wall; and



a second locking member extending from the first surface of the panel along a second edge portion of the panel, the second locking member having a configuration facing the second surface of the panel matable with the first locking member, the configuration being positioned relative to the first surface of the panel such that the first surface of the panel would align with the same if the configuration were mated with the first locking member,

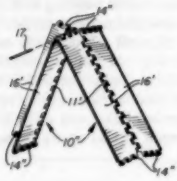
whereby, when similar panels having mating edge portions are interconnected into the first-mentioned surface, the first-mentioned surface is planer.

4,426,821

TRIANGULAR FACED POLYHEDRALS FORMED FROM END INTERCONNECTED FOLDED SHEET TRUSSES

Wayne T. Moore, 3522 Whitney Dr., Carrollton, Tex. 75007, and Oscar F. Jones, Jr., 1308 Brownwood Dr., Carrollton, Tex. 75006

Filed Apr. 7, 1980, Ser. No. 137,771
Int. Cl.³ E04H *12/18*
U.S. Cl. 52—646 **6 Claims**



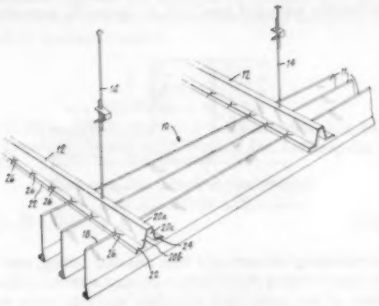
1. A structural unit for use with other like structural units to form various stable polyhedral structures of three-dimensional shapes, each said unit consisting of a pair of truss elements, with each truss element being formed of a rectangular member and having a flexible fold crease line disposed centrally and longitudinally of said member and dividing said member into two substantially duplicate rectangular halves, each rectangular half of each said member being disposed in non-coplanar relation to the other rectangular half of the same said member; each rectangular half of said member having end edges disposed transversly of the fold crease line of said member; and with an end edge of only one of the rectangular halves of one of said pair of truss element members being secured by a interconnect means to an end edge of only one of the rectangular halves of the other of said pair of truss element members.

4,426,822

VERTICAL CEILING ASSEMBLY AND STRINGER THEREFOR

J. Lynn Gailey, Newton Falls, Ohio, assignor to Alcan Aluminum Corporation, Cleveland, Ohio

Filed Nov. 1, 1982, Ser. No. 438,533
Int. Cl.³ E04C *2/42*; E04B *5/52, 1/60, 2/66*
U.S. Cl. 52—669 **6 Claims**



1. A ceiling assembly comprising

(a) an array of spaced parallel horizontally elongated panels each having opposed major surfaces oriented vertically and a longitudinal horizontal flange extending along its top edge; and

(b) a plurality of spaced parallel horizontally elongated stringers extending above and transversely of the panels for supporting the panels,

(c) each of said stringers having two opposed longitudinal horizontal flanges each formed with a downturned outer margin and a succession of slots spaced along the length of the stringer for respectively receiving top edge portions of the panels extending beneath the stringer to secure the panels to the stringer, the slots respectively formed in the two stringer flanges being in register with each other such that each panel top edge portion is received in a slot in each stringer flange,

(d) each of said slots including a stem portion extending inwardly from the edge of a stringer flange through and beyond the downturned margin thereof, and two branch portions diverging from the inner extremity of the stem portion for providing, in the stringer flange, a pair of facing spring tabs separated by the slot stem portion and each resiliently bendable about a horizontal axis parallel to the stem portion, such that an upper portion of a panel can be inserted in the slot stem portion with the panel top flange overlying one of said tabs and inserted through the slot branch portion adjacent said one tab, the panel being then retained in the slot by said one tab and by a facing edge of the other of said tabs.

4,426,823

APPARATUS AND METHOD FOR MOUNTING ROOFING TILE

Thomas R. Kobe, 2465 Wild Oak Dr., Los Angeles, Calif. 90068

Filed Jun. 2, 1981, Ser. No. 269,480
Int. Cl.³ E04B *1/00*
U.S. Cl. 52—748 **6 Claims**

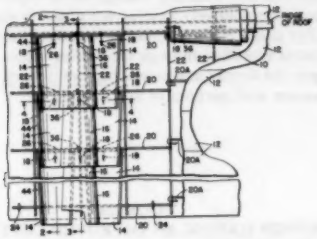
1. The method of installing tiles on a roof which comprises:

installing a water impervious membrane over the surface to be covered;

providing a grid of wires having a plurality of first wires disposed in a first direction and a plurality of second wires disposed in a second direction, said second direction being generally perpendicular to said first direction;

positioning the grid of wires over the roof to be covered

with said grid extending over the ridge of the associated roof and down to the eaves on each side thereof, one of said first wires being disposed in substantially parallel



closely spaced relationship with the ridge of the associated roof securing said grid to said roof; and

fastening a plurality of tiles to said wires extending in said first direction by means of a plurality of hooks.

4,426,824

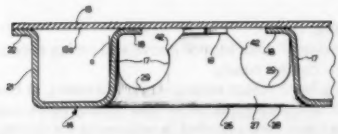
FLOOR PANEL AND METHOD OF MAKING SAME

Eugene L. Swensen, Laurel, Md., assignor to Donn Incorporated, Westlake, Ohio

Filed May 18, 1981, Ser. No. 264,932

Int. Cl.³ B32B *3/12*; E04C *2/32*

U.S. Cl. 52—794 **8 Claims**



1. A floor panel for elevated floors and the like having rectangular panels supported at their corners comprising a substantially rigid flat upper surface member formed of sheet metal, a substantially rigid lower support surface formed of sheet metal providing a substantially flat portion spaced from and substantially parallel to said upper surface member, said support member being formed with an array of circular apertures therein, the material originally located within said apertures being laterally deformed providing a plurality of integral legs having cross curvature throughout their entire lateral extend symmetrically positioned around said circular openings and extending substantially perpendicular to said flat portions to foot portions remote from said flat portions and substantially parallel thereto, said foot portions being welded to said upper surface member, said legs providing the sole connection between said lower support member adjacent to said apertures and said upper surface member, said legs cooperating to maintain the uniform spacing between said upper surface and said flat portion of said support member around said apertures so that said flat portion of said support member and said upper surface cooperate to provide a beam system resisting delection of said floor panel, opposed foot portions of a given aperture being spaced apart a distance greater than the spacing between adjacent foot portions of adjacent apertures, said lower support member being formed with side walls extending laterally from the edges thereof to said upper surface member and being secured thereto, the spacing between said apertures and said side walls being greater than between adjacent apertures.

4,426,825

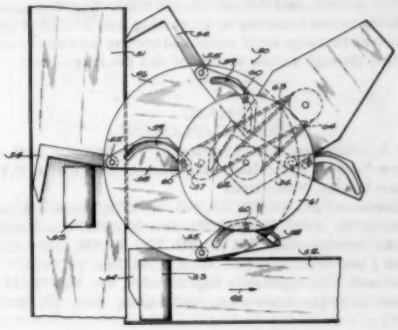
HIGH SPEED WRAPPING MACHINE

John E. Nordstrom, Two Rivers, Wis., assignor to Barbara A. Nordstrom, Two Rivers, Wis., a part interest

Continuation of Ser. No. 187,115, Sep. 15, 1980, abandoned. This application Jun. 23, 1983, Ser. No. 507,938

Int. Cl.³ B65B *7/04*

U.S. Cl. 53—378 **22 Claims**



5. A movable arm for engaging a product or wrapper, a pivot for said arm, first revolving means to carry the pivot in a circle of a first radius about a center of rotation, second revolving means revolving at a second radius around a second center of rotation, said first and second revolving means revolving in the same direction, and a non-linear cam and cam follower means connecting said second revolving means and said arm to control movement of said arm about said pivot, to provide an arm path having a high acceleration portion, a high speed portion, a product engaging portion, and a portion in which the arm slowly retreats from the product or wrapper, following each other in sequence.

4,426,826

SELF-PROPELLED HARVESTER FOR SUGAR CANE

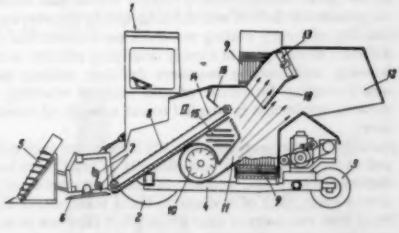
Winfried Wesselmann, Warendorf, Fed. Rep. of Germany, assignor to Claas Ohg, Harsewinkel, Fed. Rep. of Germany

Filed Apr. 13, 1982, Ser. No. 367,964

Claims priority, application Fed. Rep. of Germany, Apr. 22, 1982, 3115924

Int. Cl.³ A01D *45/10*

U.S. Cl. 56—13.3 **6 Claims**



1. A self-propelled sugar cane harvester, coomprising picking means arranged to pick sugar cane; comminuting means arranged to comminute the same; first transporting means arranged to transport the comminuted sugar cane and having an outlet from which the comminuted sugar cane is discharged; second transporting means arranged to further transport the comminuted sugar cane and locatted near said outlet end of said first transporting means so that a stream of the

comminuted sugar cane falls from said first transporting means onto said second transporting means in the region of transition between said first and second transporting means; a discharge hood having inlet and outlet; a pressure fan element located in the region of said outlet end of said first transporting means so that an air stream from said pressure fan element is directed through the comminuted sugar cane stream; an additional suction fan element arranged in said inlet of said discharge hood so as to provide for a uniform air stream in the region of transition between said first and second transpoting means; and air guiding means including an air guiding wall located in said inlet of said discharge hood under said suction fan element and extending through a cross section of said discharge hood.

4,426,827

MOWING IMPLEMENT

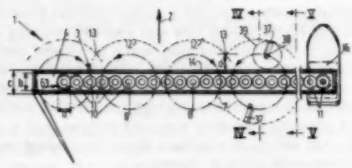
Pieter A. Oosterling, and Hendricus C. van Staveren, both of Nieuw-Vennep, Netherlands, assignors to Multinorm, B.V., Nieuw-Vennep, Netherlands

Continuation of Ser. No. 878,396, Feb. 16, 1978, abandoned, and a continuation of Ser. No. 805,395, Jun. 10, 1977, abandoned, and a continuation of Ser. No. 739,845, Nov. 9, 1976, abandoned, and a continuation of Ser. No. 536,744, Dec. 27, 1974, abandoned. This application Sep. 19, 1979, Ser. No. 77,033

Claims priority, application Netherlands, Dec. 28, 1973, 7317813

Int. Cl.³ A01D *55/18*

U.S. Cl. 56—13.6 **15 Claims**



1. A mowing implement including auxiliary frame means adapted to be connected to a powered vehicle, drive coupling means carried by the auxiliary frame means for providing drive input from the powered vehicle to the mowing implement and a rotary cutter assembly adapted to be detachably mounted on said auxiliary frame means, said cutter assembly comprising:

an elongate housing detachably mounted at one end to said auxiliary frame means and extending therefrom in a direction transversely of the direction of movement of the implement;

a plurality of substantially identical and equally spaced driven gears accommodated serially within said housing longitudinally thereof and defining spaces therebetween;

a plurality of rotary cutting members each connected to a different driven gear in closely overlying relation to said housing, said cutting members defining cutting paths which overlap forwardly of said housing whereby the mowing implement is adapted to cut a swath of standing crop;

a plurality of idler gears substantially identical to each other, and to the driven gears, said plurality of idler gears being disposed within said housing in the spaces between the driven gears, each of said spaces being substantially filled by at least two pairs of idler gears when same are in intermeshing relationship with the driven gears so that each driven gear rotates in a direction counter to that of any adjacent driven gear; each connecting means being engaged by its associated bearing means to positively locate each bearing means longitudinally of the housing, each said connecting means comprising dished a shaft welded to the top and bottom wall portions of said housing;

a drive coupling member drivingly engaging that idler gear which is located at said one end of the housing;

said housing together with said gear defining a unit in which said housing inaccessibly encloses said idler and driven gears whereby the entire unit may be replaced in the event of damage thereto, said housing comprising top, bottom and side wall portions defining the inaccessible enclosure and said unit including bearing means captive within said inclosure positively locating and rotatably supporting said idler gears, and said housing including fixed connecting means extending through the bearing means of each idler gear for fixedly interconnecting and joining said top and bottom wall portions of said housing.

4,426,828

MOWER HAVING AN IMPROVED CUTTER BAR

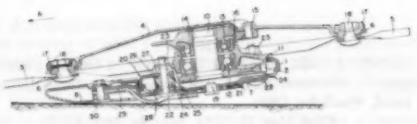
Horst Neuerburg, Haegen, France, assignor to Kuhn S.A., Saverne, France

Filed Dec. 14, 1981, Ser. No. 330,271

Claims priority, application France, Dec. 19, 1980, 80 27569

Int. Cl.³ A01D *55/18*

U.S. Cl. 56—13.6 **13 Claims**



1. In a mower movable in a predetermined direction including,

a casing,

a plurality of disks located above said casing each provided with cutting means,

bearing block means supported by said casing, at least one of said disks being guided by said bearing block means,

transmission means located in said casing for driving at least said one disk,

the improvement comprising, a plate secured to said bearing block means; and disk-protecting skid means connected to and extending in front of said plate along said direction.

4,426,829

GRASS AND DITCH MOWER

Richard W. Johnson, Rte. 1, Box 450D, Belle Rose, La. 70341

Filed Jul. 26, 1982, Ser. No. 402,207

Int. Cl.³ A01D *55/28*

U.S. Cl. 56—15.5 **1 Claim**

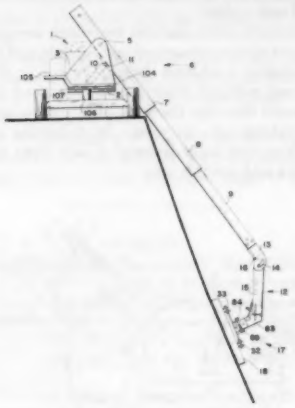
1. A grass and ditch mower comprising:

(a) a telescoping boom assembly mounted at one end on a power driven movable carriage, said boom assembly comprising two concentric tubes positioned to telescope into a third tube, a first hydraulic cylinder attached to the outside of said third tube and the outer tube of said concentric tubes at its extending end, a second hydraulic cylinder attached at the end opposite said extending end of said outer tube and the adjacent end of the other concentric tube;

(b) a cutting deck assembly having an upper deck plate pivotly mounted to said other concentric tube of said boom assembly by a cutting deck attaching assembly; and

(c) means for attaching one end of said cutting deck attaching assembly to said upper deck plate so as to provide a

floating deck assembly for closely following the contour of the surface being cut wherein said means is attached to



parallel rods, the ends of which rest on springs held in position by a housing assembly.

4,426,830

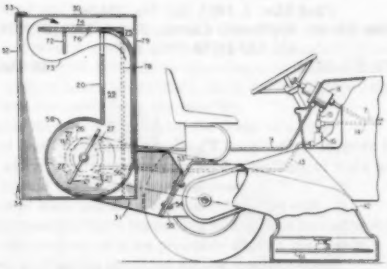
LAWN CLIPPING VACUUM COLLECTOR

DeForrest Tackett, Rte. 1, Box 192A, Reddick, Fla. 32686

Filed Sep. 27, 1982, Ser. No. 423,521

Int. Cl.³ A01D *35/262*

U.S. Cl. 56—202 **10 Claims**



1. A vacuum collector adapted to be used in conjunction with a lawn mower, comprising:

a refuse collection bin for collecting grass clippings;

a blower duct housing totally enclosed within said refuse collection bin;

an impeller within said blower duct housing, said impeller positioned in the lower section of said blower duct housing so that accumulated grass clippings will at least partially surround said portion of said blower duct housing including said impeller; and

a hydraulic motor for driving said impeller.

4,426,831

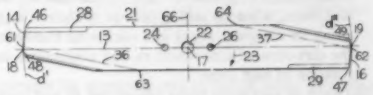
MOWER BLADE

Kenneth H. Klas, and Norbert J. Ansay, both of Port Washington, Wis., assignors to Simplicity Manufacturing, Inc., Port Washington, Wis.

Continuation of Ser. No. 355,354, Mar. 8, 1982, which is a continuation of Ser. No. 220,000, Dec. 23, 1980, abandoned. This application Jun. 6, 1983, Ser. No. 499,424

Int. Cl.³ A01D *55/18*

U.S. Cl. 56—295 **3 Claims**



1. An elongated mower blade formed from a substantially flat blank having top and bottom surfaces, parallel longitudinal edges, and opposite end edges, said blade being edgewise rotatable in one direction inside an arcuate mower housing skirt about an axis concentric to the skirt arc that extends through the center of the blade, each of said longitudinal edges thus providing a front edge for one half of the blade that terminates at one of said end edges and a rear edge for the other half of the blade that terminates at the other of said end edges, and each front edge being sharp through a distance inwardly along it from its terminal end edge to provide a cutting edge, said mower blade being characterized by:

A. an upwardly and rearwardly inclined lift portion behind each cutting edge, each said lift portion being defined by a bend that extends substantially along a line

(1) which is oblique to a rear edge,

(2) intersects said rear edge at no less than said distance inwardly along it from its terminal end edge, and

(3) intersects said terminal end edge intermediate said front and rear edges; and

B. the blade being formed from a blank wherein each of said end edges is straight and extends at a rearwardly and outwardly inclined obtuse angle to its adjacent cutting edge such that the orbits of the terminal edge of each lift portion of the blade and of the terminal end of the cutting edge are substantially equidistant from the skirt.

4,426,832

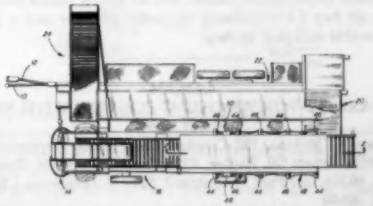
HARVESTING MACHINE SHAKER SYSTEM

John R. Porter, Waterloo, N.Y., assignor to Porter-Way Harvester Mfg. Co. Inc., Waterloo, N.Y.

Filed Dec. 31, 1981, Ser. No. 336,117

Int. Cl.³ A01D *17/00;* **B07B** *1/10*

U.S. Cl. 56—327 R **7 Claims**



1. A shaker system for separating tomatoes, and like crops, from vines in a harvesting machine, said system comprising, in combination:

(a) a continuous conveyor chain having parallel links spaced more widely than the largest nominal diameter of crops being harvested;

(b) means for driving said chain in a continuous loop having upper and lower runs; and

(c) means for imparting oscillatory, shaking movement to said upper run, the speed and magnitude of said movement being sufficient to dislodge the crops from the vines, said movement imparting means comprising:

(i) a plurality of arms each carrying a chain-engaging roller on the ends thereof;

(ii) means supporting said arms beneath the upper run of said chain for rotation about their centers in two rows each including the same number of arms, said rows being spaced by a distance slightly less than the width of said chain, whereby said upper run of chain is supported along its marginal edges and oscillated transversely to the direction of movement in said continuous loop by rotation of said arms;

(iii) each of said arms being connected to and rotated by an individual hydraulic motor, the motors connected to successive arms in each of said rows being of different capacity; and

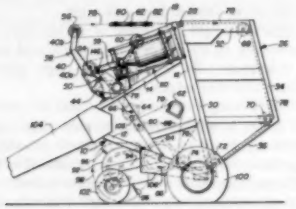
(iv) means supplying hydraulic fluid under pressure to said motors to drive the latter at predetermined speeds.

4,426,833

BALING MACHINE WITH AIR SPRING MEANS FOR MAINTAINING APRON TENSION

Willis R. Campbell, Ephrata, Pa., assignor to Sperry Corporation, New Holland, Pa.

Filed Dec. 21, 1981, Ser. No. 333,002
Int. Cl.³ A01D *39/00*
U.S. Cl. 56—341 **14 Claims**



14. In a roll baling machine having a frame, apron means supported on said frame defining an expandable bale chamber, said apron means moving from a first position to a second position during formation of a roll bale in said expandable bale chamber, means supported on said frame for picking up crop material and for delivering said crop material to said expandable bale chamber, the improvement comprising:

air spring means connected to said apron means to maintain tension in said apron means, said air spring means including an air bag for containing air under pressure and a piston movable into said air bag.

4,426,834

APPARATUS FOR WRAPPING CONDUIT WITH SHEET MATERIAL

Richard C. Dokmo, 108 Crooked Creek Trail, Barrington, Ill. 60010; Ernest M. Hepler, 2726 Central St. #4-B, Evanston, Ill. 60201, and Paul Holmstrand, 5217 N. Glenwood, Chicago, Ill. 60640

Filed Dec. 14, 1981, Ser. No. 330,213
Int. Cl.³ B65H *81/08, 81/02*
U.S. Cl. 57—10 **11 Claims**

1. Apparatus for wrapping an elongated conduit with sheet material comprising:

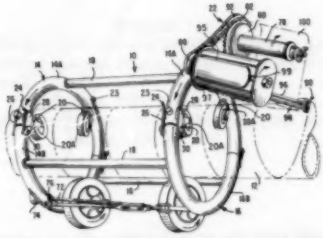
a frame assembly adapted to circumscribe a conduit;

means for retaining said conduit within said frame assembly while said frame assembly is rotated around said conduit during wrapping of said sheet material on said conduit;

means for feeding a strip of said sheet material against an outer surface of said conduit;

an axially rotatable sheet material tensioning means disposed between said feeding means and said conduit, said tensioning means including a channel defined by a pair of parallel, spaced sheet material guide members, spaced to form a channel wider than that thickness of said sheet material;

a backing material take-up means for collecting a backing material from said sheet material as said sheet material is wrapped on said conduit; and,



means for interconnecting said sheet material feeding means to said backing material take-up means so that rotational movement of said sheet material feeding means causes simultaneous rotational movement of said backing material take-up means;

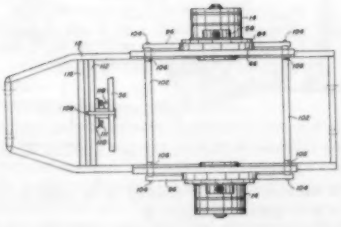
said sheet material feeding means comprising a first elongated reel secured to a first means for rotating said first elongated reel and said backing material take-up means comprising a second elongated reel secured to a second means for rotating said second elongated reel, with said first and second reel rotating means being interconnected by said interconnecting means.

4,426,835

REEL HOLDER AND CLAMPING ARRANGEMENT FOR A STRANDER CRADLE ASSEMBLY

Rokuzo Ito, Toronto, Canada, assignor to Canada Wire and Cable Limited, Toronto, Canada

Filed Mar. 2, 1982, Ser. No. 354,061
Claims priority, application Canada, Jun. 4, 1981, 379004
Int. Cl.³ D07B *7/06, 3/02*
U.S. Cl. 57—127.7 **10 Claims**



1. A reel holder and clamping arrangement for a strander cradle having a pair of side frame members comprising:

(a) two pintle assemblies each including a bearing housing, a pintle rotatably mounted in said bearing housing and means for mounting each bearing housing in axial alignment one on each side frame member;

(b) first cam means associated with at least one of said pintle

assemblies for moving its associated pintle along the axis of a reel for clamping a reel between the pintles;

(c) a reel holder engaging the flanges of the reel when the reel is received within the cradle for positioning the core of the reel in alignment with the pintles of the pintle assemblies;

(d) second cam means associated with at least one of said pintle assemblies for moving the reel holder out of engagement with the flanges of the reel when the reel is clamped between the pintles; and

(e) means for actuating said first and second cam means to simultaneously clamp the reel between the pintles and disengage the reel holder from the flanges of the reel.

4,426,836

SPINNING PREPARATORY MACHINE

Emil Briner; Peter Novak, both of Winterthur, and Hermann Gasser, Frauenfeld, all of Switzerland, assignors to Rieter Machine Works Limited, Winterthur, Switzerland

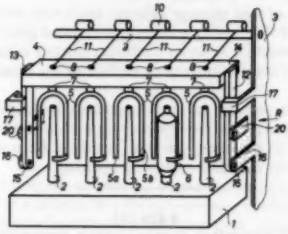
PCT No. PCT/EP80/00090, § 371 Date May 28, 1981, § 102(e) Date Apr. 20, 1981, PCT Pub. No. WO81/00867, PCT Pub. Date Apr. 2, 1981

PCT Filed Sep. 3, 1980, Ser. No. 261,152

Claims priority, application Switzerland, Sep. 28, 1979, 8766/79

Int. Cl.³ D01H 9/04

U.S. Cl. 57—267 **9 Claims**



1. A spinning preparatory machine comprising:

a machine frame;

a plurality of spindles arranged at said machine frame in at least one row;

a plurality of flyers suspended above said row of spindles and pivotable about a common virtual longitudinal axis of the machine between an operating position and a doffing position where the bobbins can be doffed without obstruction upwardly from the spindles;

frame means for supporting the flyers in a row;

said frame means comprising a longitudinal support beam and at least two arms arranged essentially at right angles to said longitudinal support beam;

said at least two arms each having a free end;

said machine frame supporting said at least two arms at their free ends so as to be pivotable about a pivot axis;

first stop means provided for the machine frame;

at least one pivoting and loading system for pressing said at least two arms in an operating position thereof against said first stop means;

said pivoting and loading system containing a spring; and

means for kinematically connecting the pivoting and loading system with the frame means and with the machine frame in such a manner that in an operating position of the frame means the pivoting and loading system can be brought into a locking position, after passing an unstable position where the loading pressure is greatest, and in which locking position the loading pressure is lower.

4,426,837

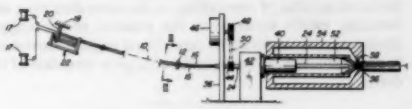
APPARATUS FOR STRANDING WIRE

Norbert J. Meilenner, St. Catharines; Richard T. Sunderland, and John W. Cook, both of Kingston, all of Canada, assignors to Northern Telecom Limited, Montreal, Canada

Filed Aug. 30, 1982, Ser. No. 413,177

Int. Cl.³ H01B 13/04

U.S. Cl. 57—293 **16 Claims**



1. Apparatus for stranding and covering wires comprising:

(a) an elongate member having a longitudinal axis, being rotationally flexible about said axis to enable it to be torsionally twisted in alternating directions, and defining a plurality of feedpaths for wires along the member;

(b) holding means for holding the elongate member stationary at a position upstream of the wire guiding elements;

(c) wire twisting means rotatable with a downstream end of the elongate member and defining a plurality of angularly spaced and longitudinally extending holes, one for each of the paths;

(d) rotating means for rotating the twisting means together with the downstream end of the elongate member for a predetermined number of revolutions about the axis alternatively in one direction and then the other;

(e) an extension of the elongate member extending downstream from the rotating means to ensure stranding together of twisted wires is avoided until wires pass at least into a downstream end part of the extension; and

(f) an extruder for plastic insulation for stranded wires, the extruder having an annular barrel extending along and surrounding the extension and extending radially inwards of an outlet end to define an annular extrusion orifice around a feed path for stranded wires and adjacent to and immediately downstream from the downstream end of the extension.

4,426,838

APPARATUS FOR STRANDING WIRES

John N. Garner, Kingston; Jean M. Roberge, Pointe Claire, and Norbert J. Meilenner, St. Catharines, all of Canada, assignors to Northern Telecom Limited, Montreal, Canada

Filed Aug. 30, 1982, Ser. No. 413,178

Int. Cl.³ H01B 13/04

U.S. Cl. 57—293 **17 Claims**

1. Apparatus for stranding wires comprising:

a guide means having a longitudinal axis and being rotationally flexible about said axis and defining individual feed paths for the wires along the guide means;

holding means to hold the guide means against rotation about said axis at an upstream position of the guide means;

wire twisting means at a downstream position of the guide means to torsionally twist the wires, the twisting means rotatable with a downstream part of the guide means, said feed paths extending through the twisting means;

rotating means for rotating the twisting means together with the downstream part of the guide means for a predeter-

mined number of revolutions about the axis alternately in one direction and then the other;

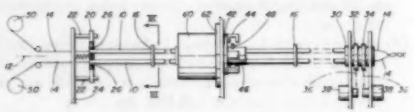
direction changing means to change the direction of rotation to the twisting means after the twisting means has rotated the predetermined number of revolutions in each direction, said changing means comprising a trigger device secured to the guide means upstream of the wire twisting means to rotate with the guide means and execute a determined angular movement in each direction which is indicative of the rotation of the twisting means for said predetermined number of revolutions in the same direction, and initiating means sensitive to the position of the trigger device upon completing its determined angular movement in each direction, to initiate said change in direction of the drive.

4,426,839

STRANDING WIRES

John N. Garner, Ontario, and Jean M. Roberge, Pointe Claire, both of Canada, assignors to Northern Telecom Limited, Montreal, Canada

Filed Aug. 30, 1982, Ser. No. 413,179
Int. Cl.³ H01B *13/04*
U.S. Cl. 57—293 **12 Claims**



1. Apparatus for stranding wire comprising:

a tubular means defining passage means forming at least two feedpaths for wires along the tubular means with the feedpaths held in fixed positions apart in at least some locations along the tubular means, the tubular means being rotatably flexible about a common axis to torsionally twist the tubular means and thus the passage means around said axis from an untwisted position;

holding means to hold the tubular means against rotation about said axis at an upstream position of the tubular means;

wire twisting means at a downstream position of the tubular means to torsionally twist the tubular means, said feedpaths extending through the twisting means;

rotating means for rotating the twisting means together with the downstream part of the tubular means for a predetermined number of revolutions about the common axis alternately in one direction and then the other;

direction changing means to change direction of rotation of the twisting means after the twisting means has rotated the predetermined number of revolutions in each direction; and

resilient means associated with one of the ends of the tubular means to enable movement of said one end in the axial direction during twisting and untwisting of the tubular means.

4,426,840

OPEN-END SPINNING MACHINE

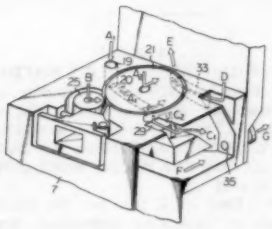
Yoshiharu Yasui, Kariya; Keiji Onoue, Toyota; Kozo Motobayashi, Aza-Nodamachi, and Toshio Yoshizawa, Chiryu, all of Japan, assignors to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho, Aichi, Japan

Filed Dec. 23, 1981, Ser. No. 333,918
Claims priority, application Japan, Dec. 29, 1980, 55-185344
Int. Cl.³ D01H *1/135, 7/888, 13/14*
U.S. Cl. 57—301 **10 Claims**

1. An open-end spinning machine having at least one spinning unit having a feed roller for feeding fibrous material, a combing roller for combing said fibrous material fed thereto by said feed roller, a spinning rotor for spinning the fibrous material combed by said combing roller into a yarn, a combed fibrous material channel extending from the vicinity of said combing roller to the inside of said spinning rotor for delivering said combed fibrous material to said rotor, and a dust removing opening communicating with said combing roller for removing dust from said fibrous material, said spinning machine comprising:

air filtering means disposed adjacent an external surface of said spinning machine for filtering a first stream of inlet air;

a first air passage communicating with said air filtering means, said passage supplying filtered inlet air to said channel and



said dust removing opening via passage portions adjacent the upper surface of said feed roller and the upper and lower surfaces of said combing roller,

the portion of said passage adjacent the lower surface of said combing roller having a laterally elongated generally elliptical cross-section so as to distribute filtered inlet air over a major portion of the bottom surface of the combing roller; and

a second air passage for communicating a second stream of inlet air to a region communicating with said dust removing opening, to transport the dust removed from said fibrous material via said dust removing opening.

4,426,841

GAS TURBINE COMBUSTOR ASSEMBLY

Walter Cornelius, Troy, and Edward D. Klomp, Mt. Clemens, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Jul. 2, 1981, Ser. No. 279,960
Int. Cl.³ F02C *7/042*
U.S. Cl. 60—39.23 **1 Claim**

1. In a gas turbine engine having a pressurized air plenum and a combustor assembly disposed in said plenum including wall means having a plurality of fixed flow area ports between said plenum and a reaction chamber defined by said wall means, the combination comprising means on said combustor assembly defining at an upstream end thereof an annular air passage between said plenum and said reaction chamber having a plurality of generally radially extending swirl inducing vanes therein, a radially adjustable cylindrical partition disposed in said air passage between said swirl inducing vanes operative to divide said air passage into an outer annular excess

air portion and an inner annular prechamber portion, the flow areas of said excess air portion and said prechamber portion varying in mutually inverse relationship and combining to always be substantially equal to the flow area of said air passage, means on said combustor assembly operative to adjust and maintain the radial position of said cylindrical partition thereby to simultaneously vary in mutually inverse relationship the flow area of each of said prechamber portion and said excess air portion, and a fuel nozzle disposed on said combustor assembly including a plurality of fuel ports operative to inject fuel into said prechamber portion for vaporization and combination with air flowing therethrough to provide a combustible mixture in said reaction chamber of properly lean air-fuel ratio for low emission combustion.

4,426,842

SYSTEM FOR HEAT RECOVERY FOR COMBUSTION MACHINE INCLUDING COMPRESSOR FOR COMBUSTION AIR

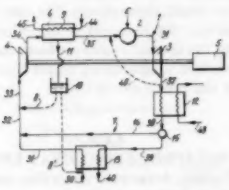
Peter J. Collet, Bunnik, Netherlands, assignor to Nederlandse Centrale Organisatie Voor Toegepast-Natuurwetenschappelijk Onderzoek, The Hague, Netherlands

Filed Feb. 24, 1981, Ser. No. 237,651

Claims priority, application Netherlands, Mar. 12, 1980, 8001472

Int. Cl.³ F02C 7/10

U.S. Cl. 60—39.511 **15 Claims**



1. In a system for generating power including a combustion machine and a compressor for compressing incoming combustion air, in which exhaust gases after their expansion in the combustion machine contain both sensible heat and latent heat of vaporization in the form of water vapor, means for recovering heat from said exhaust air compressing means for transferring both latent heat and sensible heat from said exhaust gases to said incoming combustion air before its entry into said compressor and for storing at least a portion of the transferred heat as latent heat, in the form of vaporized water, in said incoming combustion air, and means, arranged between said compressor and said combustion machine, for removing stored latent heat from said combustion air for use in another system, comprising a condensing cooler means for condensing at least a part of the water vapor.

4,426,843

CO_2 COUPLING MATERIAL

Michael C. Fowler, Farmington, and David C. Smith, Glastonbury, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Nov. 12, 1980, Ser. No. 206,206

Int. Cl.³ F02K 9/95

U.S. Cl. 60—203.1 **3 Claims**

1. A method for converting electromagnetic radiation energy from a CO_2 laser to kinetic energy of a kinetic fluid comprising the steps of:

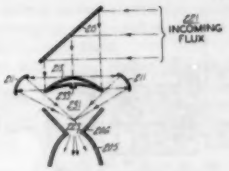
mixing a low atomic weight working fluid that is substantially transparent to CO_2 radiation with a predetermined portion of a radiation conversion material having triatomic molecules with atomic weights of less than 20 to form a kinetic fluid;

passing said kinetic fluid into a heating chamber;

generating at least one beam of CO_2 optical radiation and having at least one power level;

transporting said at least one beam of optical radiation to said heating chamber;

focusing said at least one beam of optical radiation to at least one predetermined focus area within said heating chamber;



absorbing electromagnetic energy from said at least one beam in said focus area by interaction with said radiation conversion material; and

transferring kinetic energy from said radiation conversion material to said working fluid, said at least one focus area being related to said at least one power level so that a portion of said kinetic fluid within said focus area is raised to a nonequilibrium state having a highest temperature between about 1,000° K. and about 5,000° K.

4,426,844

ENGINE MUFFLER OF HEAT-EXCHANGING TYPE

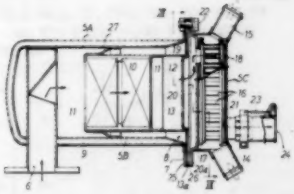
Keiichi Nakano, Sakaishi, Japan, assignor to Kubota Ltd., Osaka, Japan

Filed Mar. 19, 1982, Ser. No. 359,844

Claims priority, application Japan, Mar. 26, 1981, 56-43558[U]

Int. Cl.³ F01N 3/28

U.S. Cl. 60—295 **3 Claims**



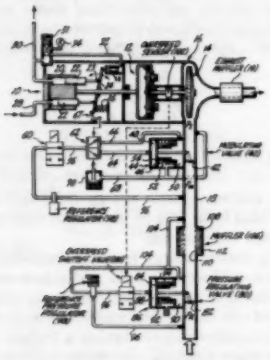
1. An engine muffler of heat-exchanging type, wherein an opening **8** is formed in a muffler casing **5A** of a heat-insulated construction, a catalyst casing **5B** packed with a catalyst **11** is removably inserted into said muffler casing **5A** through said opening **8**, a heat-exchanger casing **5C** for recovery by absorption with a liquid means of the heat contained in the exhaust gas coming out of said catalyst casing **5B** is attached to said opening **8** of said muffler casing **5A** and these three casings **5A**, **5B** and **5C** are connected together by clamping means **22**.

4,426,845

NOISE REDUCTION IN PNEUMATICALLY DRIVE HYDRAULIC PUMP

George W. Brooks, La Conner; John W. Hart, Everett, and Egil R. Pettersen, Kent, all of Wash., assignors to The Boeing Company, Seattle, Wash.

Filed Feb. 17, 1981, Ser. No. 234,759
Int. Cl.³ F16D 33/02
U.S. Cl. 60—347 13 Claims



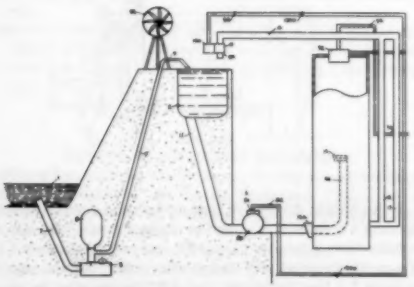
1. In pneumatically driven turbine machinery, wherein a modulating valve meters pressurized gas from a source of high pressure gas to a gas turbine with the modulating valve being operable to directly control the speed of the gas turbine by varying the pressure at which gas is supplied to the gas turbine, the improvement directed to reduction of noise emitted by said machinery, comprising pressure regulating means interposed between said source of high pressure gas and said modulating valve to reduce the pressure applied to the upstream side of said pressure modulating valve to a pressure sufficiently high to effectively control said turbine by operation of said modulating valve, said pressure regulating means thereby operating to reduce the noise level of said modulating valve and of said machinery.

4,426,846

HYDRAULIC POWER PLANT

Wayne Bailey, R.D. #2, Schaghticoke, N.Y. 12154

Filed Apr. 24, 1978, Ser. No. 899,469
Int. Cl.³ F03B 13/06
U.S. Cl. 60—398 1 Claim



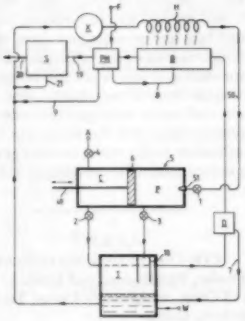
1. An hydraulic power system comprising:
(a) a first reservoir of liquid;
(b) a second reservoir located at an elevation higher then the first reservoir;
(c) means for pumping the liquid in the first reservoir to said second reservoir;
(d) a plurality of holding tanks located at a lower elevation than that of said second reservoir;
(e) a fluid conduit connecting said second reservoir with said holding tanks;
(f) an hydraulic prime mover located in said conduit, whereby liquid flowing from said second reservoir to said tanks generates a work output;
(g) automatic valve means in the fluid conduit and cooperatively associated with each tank such that liquid flows from said conduit into only one tank at a time, said valve means automatically stopping liquid flow into a tank when a predetermined liquid level in said tank is reached, and upon cessation of flow in one tank, automatically commencing flow of liquid to the other tank;
(h) means for removing liquid from the tanks when the predetermined liquid level is reached and liquid flow to the tank is stopped by the valve means;
(i) said means for removing liquid including at least one air compressor in which compressed air is used to said liquid from each tank under the pressure of the compressed;
(j) said means for removing liquid further including a second conduit for receiving liquid driven from said tanks and for delivering said liquid to the second reservoir;
(k) a second hydraulic prime mover located in said second conduit for obtaining a work output from the flow of liquid in said second conduit;
(l) whereby liquid alternatively fills one tank from the second reservoir while liquid in the other tank is being returned to the second reservoir from the other tank,
wherein work is produced by liquid flow to and from said tanks by the prime movers.

4,426,847

RECIPROCATING HEAT ENGINE

Victor H. Fischer, Artarmon, Australia, assignor to Thermal Systems Limited, Cayman Islands

Filed Dec. 12, 1980, Ser. No. 215,825
Claims priority, application Australia, Aug. 18, 1980, PE5094
Int. Cl.³ F01K 7/36
U.S. Cl. 60—514 25 Claims



1. A method of operating a reciprocating external combustion engine having a cylinder and a piston therein defining a working end space, wherein energy is supplied to the working end space by means of a vaporizable heat-transfer medium, which comprises
(1) in a compression stroke of the piston, compressing vapor heat-transfer medium present in the end space;
(2) generating externally of the cylinder heated heat-transfer medium under a pressure such as to maintain the medium in the liquid state;
(3) injecting into the compressed vapor heat-transfer me-

dium in the working space said pressurized heated liquid medium, whereby part of the liquid medium spontaneously vaporizes, the remainder remaining as liquid, and raises the internal energy of the working space;

(4) in an expansion stroke of the piston, allowing the volume of the end space to expand thereby driving the piston, and allowing some recondensation of vaporized medium to occur;

(5) exhausting a mixture of liquid and gaseous heat-transfer medium from the end space and leaving in the end space residual gaseous heat-transfer medium;

(6) receiving said exhausted mixture of liquid and gaseous heat-transfer medium in a trap; and

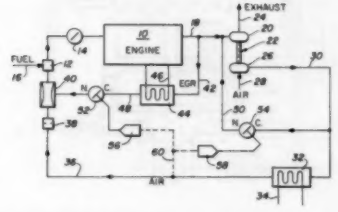
(7) recycling heat-transfer medium in the liquid state from the trap to step (2) for the generation of further pressurized heated liquid heat-transfer medium.

4,426,848

TURBOCHARGED ENGINE EXHAUST GAS RECIRCULATION SYSTEM

Robert W. Stachowicz, New Berlin, Wis., assignor to Dresser Industries, Inc., Dallas, Tex.

Filed Nov. 20, 1981, Ser. No. 323,167
Int. Cl.³ F02B *37/00*; F02M *25/06*
U.S. Cl. 60—605 **8 Claims**



1. An improved exhaust gas recirculation system for turbocharged gaseous fuel engines including an exhaust gas pipe, an exhaust driven turbocharger connected to the exhaust pipe, and a gaseous fuel supply connected to a carburetor for the engine, the improvement comprising:

exhaust conduit means connected to the exhaust pipe between the engine and turbocharger;

first air conduit means connected to the turbocharger;

venturi means connected with said exhaust and first air conduit means and with the engine carburetor;

second air conduit means connecting said first air conduit means with the exhaust pipe for increasing the pressure in said exhaust pipe;

first valve means located in said exhaust conduit means for controlling the flow of exhaust gas therethrough;

second valve means located in said second air conduit for controlling the flow of air therethrough; and,

valve control means connected with both said valve means for opening said valve means when the engine is operating at more than idle speed or when loaded and permitting said valve means to close during starting and idling of the engine.

4,426,849

GRAVITY HEAD REHEAT METHOD

Hugh B. Matthews, Boylston, Mass., assignor to Sperry Corporation, New York, N.Y.

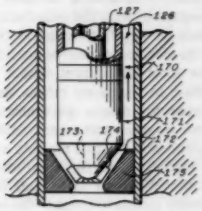
Filed Mar. 25, 1981, Ser. No. 247,435
Int. Cl.³ F03G *7/00*
U.S. Cl. 60—641.4 **1 Claim**

1. Apparatus for recovery of thermal energy from a hot source of fluid within the interior region of the earth comprising:

heat exchanging means extending substantially from a first station adjacent said surface of said earth to a second station within said earth for downwardly conveying a working fluid initially in a relatively cool state from said first station to said second station and converting said fluid into energetic fluid in a supercritical state, wherein said heat exchanging means includes tubular means for increasing the heat transfer from the hot source of fluid to the working fluid from the second station to the first station,

motive means at said second station operatively coupled to said heat exchanging means and responsive to the flow of the energetic working fluid,

pump means at said second station operatively coupled to and responsive to said motive means for pumping the hot source of fluid from said interior regions through said heat exchanging means in heat transfer relationship with said working fluid,



conductive conduit means for reheating and upwardly conveying said working fluid after partial cooling due to transferring energy to drive said motive means, said conduit extending from a point beyond said motive means upwards to a point where the temperature of said upwardly conveyed working fluid exceeds the temperature of said downwardly flowing working fluid so as to extract additional heat energy from said downwardly flowing working fluid and said hot source of fluid, whereby heat is regained to compensate for said partial cooling, and

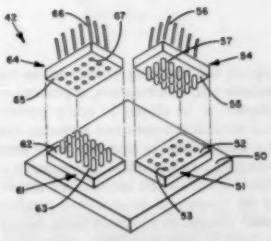
insulative conduit means disposed between said conductive conduit and said first station, for upwardly conveying said energetic working fluid from said conductive conduit means to said first station.

4,426,850

HEAT PUMP CONTROL HAVING AN ELECTRONIC CONTROL MODULE WITH A BYPASS SYSTEM

Wayne R. Reedy, Cazenovia, N.Y., assignor to Carrier Corporation, Syracuse, N.Y.

Filed Mar. 29, 1982, Ser. No. 362,779
Int. Cl.³ F25B *49/00*; F25D *29/00*
U.S. Cl. 62—125 **4 Claims**



1. An electrical control system for environmental conditioning equipment comprising:

a thermostatic control means for generating predetermined patterns of electrical control signals with each control signal

pattern corresponding to a selectable setting of said thermostatic control means;

relay means for receiving electrical signals and for controlling selected functions of the conditioning equipment in response to the received electrical signals;

an electronic control module for receiving a plurality of electrical input signals, for processing the input signals according to preprogrammed procedures, and for generating a plurality of electrical output signals in response to the processed input signals;

a first electrical connector means with a plurality of electrical input leads arranged in a preselected pattern, for connecting at least the thermostatic control means to the electronic control module, to input the electrical control signals generated by the thermostatic control means to the electronic control module; and

a second electrical connector means with a plurality of electrical output leads arranged in another preselected pattern which is compatible with the preselected pattern of electrical input leads of the first electrical connector means, for connecting the electronic control module to the relay means to supply the electrical output signals from the electronic control module to the relay means, said first and second electrical connector means disconnectable from the electronic control module and connectable to each other to bypass the electronic control module and to supply at least the control signals from the thermostatic control means directly via the electrical input and the electrical output leads to the relay means to operate the environmental conditioning equipment directly under control of the thermostatic control means when the first and second electrical connector means are connected to each other.

4,426,851

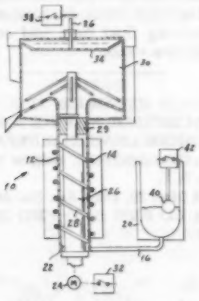
ICE MAKER DIAGNOSTIC SYSTEM

Charles G. Neumann, Palatine, Ill., assignor to Reynolds Products Inc., Schaumburg, Ill.

Filed Aug. 26, 1982, Ser. No. 411,645

Int. Cl.³ F25B *49/00*

U.S. Cl. 62—126 **8 Claims**



5. A circuit for applying power to an ice maker from a source including in combination, a power-on light, an on-off switch adapted to be closed to apply power to said light, a plurality of condition responsive switches each having a first state and a second state in response to an abnormal condition, means connecting said condition responsive switches in series between said on-off switch and said ice maker to apply power thereto in the absence of an abnormal condition and with said on-off switch closed, an indicator light, means connecting said indicator light to said condition responsive switches to be illuminated in response to movement of one of said switches to its second state, an operator-accessible manually-actuatable element, a first switch responsive to actuation of said element for bypassing a first one of said condition responsive switches to energize said ice maker with said first condition responsive switch in its second state to indicate the existence of a first abnormal condition, and a second switch responsive to actuation of said element for bypassing a second one of said condition responsive switches to energize said ice maker with said second condition responsive switch in its second state to indicate the existence of a second abnormal condition.

4,426,852

AIR-CONDITIONING CONTROL APPARATUS FOR AUTOMOTIVE VEHICLES

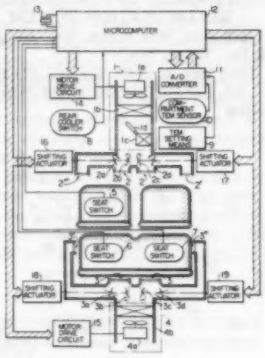
Masao Nishimura, Anjo; Teiichi Nabeta, Okazaki, and Toshitaka Fujiwara, Kariya, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed May 6, 1981, Ser. No. 260,601

Claims priority, application Japan, Feb. 5, 1980, 55-62518

Int. Cl.³ F24F *7/00*; B60H *3/00*

U.S. Cl. 62—179 **5 Claims**



1. An automobile air-conditioned control apparatus comprising:

temperature setting means for establishing a desired temperature which is manually set by occupants;

temperature sensor means for detecting a representative temperature within compartment of the automobile;

seat switch means providing seat signals when the occupants occupy their seats;

electronic control unit means for performing digital computational operations in accordance with said desired temperature signal, said representative temperature signal and said seat signals;

motor drive circuit means responsive to command signals of said microcomputer means to provide a drive signal;

blower motor means responsive to said drive signal for providing conditioned air into the compartment of the automobile;

shifting actuator means responsive to the command signal of said microcomputer means for providing a shifting signal;

outlets means having a plurality of flow direction changing plates which are actuated by said shifting signal successively and gradually.

4,426,853

AIR CONDITIONING SYSTEM

Akio Mitani, Yokohama; Koichi Matsui, Tokyo, and Hirotsugu Sakata, Chigasaki, all of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Jan. 20, 1982, Ser. No. 341,065

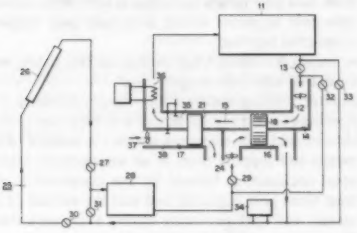
Claims priority, application Japan, Jan. 26, 1981, 56-10058

Int. Cl.³ F25B *27/00*; F23L *15/02*

U.S. Cl. 62—235.1 **7 Claims**

1. An air conditioning system for conditioning air inside a room, said air conditioning system comprising:

(a) a first air duct having:
(i) an inlet port opening into said first air duct from the room and
(ii) an exhaust port opening into the room from said first air duct;
(b) a room air circulating mechanism:
(i) for introducing the air inside the room into said first air duct through said inlet port and
(ii) for discharging the air inside said first air duct into the room through said outlet port;
(c) solar heat collecting means for producing hot air by utilizing solar heat;
(d) a second air duct having a bordering portion adjacent to said first air duct on the inlet port side thereof;
(e) hot air feeding means for feeding the hot air from said solar heat collecting means into said second air duct;
(f) a rotary total heat exchanger for dehumidification disposed between said first air duct and the bordering portion of said second air duct so as to extend into and communicate with both of said ducts, said rotary total heat exchanger being rotated so as to cause air flowing through said first air duct to exchange heat with air flowing through said second air duct;



(g) a third air duct having:
(i) a bordering portion adjacent to said first air duct on the downstream side of the rotary total heat exchanger;
(ii) an inlet port opening into said third air duct from the outside; and
(iii) an exhaust port to the outside from said third air duct;
(h) outside air feeding means:
(i) for feeding the outside air into said third air duct through said inlet port and
(ii) for discharging the air inside said third air duct to the outside through said outlet port;
(i) a stationary multi-diaphragm-type sensible heat exchanger for cooling disposed between said air duct and the bordering portion of said third air duct so as to extend into and communicate with both of said ducts so as to cause air flowing through said first air duct to exchange heat with air flowing through said third air duct; and
(j) a humidifier disposed inside said first air duct between said exhaust port of said first air duct and said stationary multi-diaphragm-type sensible heat exchanger so as to evaporation-cool air passing therethrough.

4,426,854

SLIP-ON CONNECTOR FOR JEWELRY CLASP AND BLANK FOR CLASP

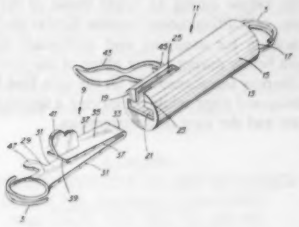
Simon Geldwerth, Brooklyn, and Mendek Rubin, New York, both of N.Y., assignors to Do-All Jewelry Mgf. Co., Inc., Brooklyn, N.Y.

Filed May 17, 1982, Ser. No. 379,188

Int. Cl.[3] **A44C** *5/00*; **B23K** *33/00*; **A44B** *19/00*; **F16G** *15/00*

U.S. Cl. 63—4 **17 Claims**

1. A jewelry clasp for a jewelry band having chain link terminals, said jewelry clasp comprising:
(a) a male clasp member;
(b) a female clasp member adapted to be releasably interconnected with said male clasp member; and
(c) at least one slip-on connection means for attachment to at least one of said chain link terminals of the jewelry band, said slip-on connection means having two spaced portions and being rigidly secured to and being provided for at least one of said male and female clasp members;
whereby at least one of said chain link terminals may be inserted into at least one of said connection means so as to be directly inserted into linking engagement therewith by insertion through the space between said spaced portions



and secured thereto without soldering, and whereby said one of said chain link terminals can be securely snagged onto said slip-on connection means without closing said spaced portions of said slip-on connection means.

12. A blank for forming the male clasp member of a jewelry clasp comprising releasable interlocking male and female clasp members, said blank comprising:
(a) a substantially rectangular elongated flat body having a notch formed at one end thereof; and
(b) a leg extending transversely to said elongated body, said leg being adapted to become bulbous when heated so as to form a pin.

4,426,855

YARN FEEDER MECHANISMS

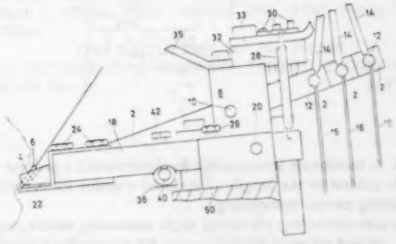
Anthony J. Wells, Cosby; William C. Smith, Leicester, and Gerald A. G. Seekings, Birstall, all of England, assignors to The Bentley Engineering Co., Ltd., Leicester, England

Filed Aug. 14, 1981, Ser. No. 293,443

Claims priority, application United Kingdom, Aug. 19, 1980, 8026987

Int. Cl.[3] **D04B** *15/08, 15/58*

U.S. Cl. 66—125 R **7 Claims**



1. A yarn feeder mechanism for a circular knitting machine comprising:
a plurality of yarn feed fingers, a yarn feed extremity being located at the front end of each of said fingers;
means for selectively actuating said fingers to cause each yarn feed extremity to move between a flow feed position and a high inactive position;
a latchguard plate;
a mounting supporting said latchguard plate, said mounting

being pivotable to move said plate between a low, latch-guarding position and a high, inactive position wherein the latchguard is clear of a needle cylinder;

adjustable abutment means for each of said yarn feed fingers, said abutment means engaging the yarn feed fingers at a point displaced from the yarn feed extremities thereof, said abutment means limiting downward movement of the extremities and adjustably spacing the extremities from the latchguard plate in the low position; and

means for lifting said yarn feed fingers and said latchguard plate, said lifting means including a pivotable member having a front face part for engaging the yarn feed fingers from below during an initial phase of the lifting movement, said lifting means member further having a sideways extension for engaging said latchguard plate mounting from below during a later phase of the movement thereof to thereby simultaneously lift the yarn feed fingers and the latchguard plate while preserving a spacing between said plate and the yarn feed extremities.

4,426,856

MEASURING ARRANGEMENT FOR DETERMINING A PROCESS VARIABLE OF A WINDING ARRANGEMENT

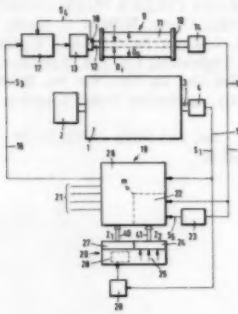
Karl Winter; Friedrich Gille, both of Obertshausen, and Hans Lotz, Muhlheim, all of Fed. Rep. of Germany, assignors to Karl Mayer Textilmaschinenfabrik GmbH, Obertshausen, Fed. Rep. of Germany

Filed Mar. 19, 1982, Ser. No. 359,993

Claims priority, application Fed. Rep. of Germany, Mar. 20, 1981, 3111112

Int. Cl.³ D04B *27/10*

U.S. Cl. 66—212 **6 Claims**



1. A measuring arrangement for determining a process variable related to the length of material transfer for a rotatable winding carrier comprising:

a non-contacting rotational angle measuring means coupled to and actuated by said carrier for generating a rotational angle signal signifying the rotation degree and direction of said carrier;

an input means for providing predetermined calculation data, said data including at least values corresponding to the winding diameter of and the layer thickness of said winding carrier; and

computing means coupled to said input means and said angle measuring means for computing said process variable from said calculation data and said rotational angle signal.

4,426,857

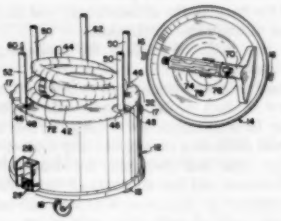
STEAMING APPARATUS

Eugene G. Epstein, Highland Park, N.J., assignor to Epstein Marketing Corp., North Brunswick, N.J.

Filed Feb. 26, 1982, Ser. No. 352,697

Int. Cl.³ D06F *71/34*

U.S. Cl. 68—222 **19 Claims**



1. Apparatus for spraying steam comprising:

a flexible steam transporting hose;

pole means for providing a pole support for said flexible hose, said pole means including at least three interconnectable pole segments which form said pole support when connected together;

base means including a top surface and mounting means for mounting said pole support; and

enclosure forming means comprising a plurality of spaced openings in said top surface of said base means adapted to receive said pole segments within the interior of said base means and support them in an arrangement such that an open enclosure is formed by the cooperation of said at least three pole segments and said top surface of said base means, said open enclosure having a size such that at least the major portion of said flexible hose can be contained therein.

4,426,858

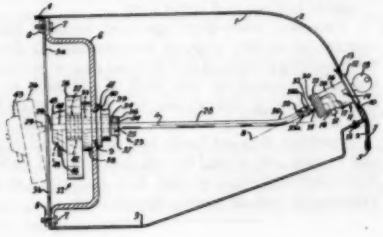
TAMPER DEACTIVATING ASSEMBLY

Bruno Interrante, 371 Charles Ave., Massapequa Park, N.Y. 11762

Filed Jun. 1, 1981, Ser. No. 269,378

Int. Cl.³ E05B *15/00, 17/00, 63/00*; E05C *3/16*

U.S. Cl. 70—1.5 **21 Claims**



1. Tamper deactivating pivotal motion transmission assembly comprising

a bearing member having an inward side and an outward side, and including a wall portion containing an open ended bore substantially concentric to an axis and extending through the member from one side to the other side of the member, and further including a hollow tube portion on the wall portion having a tube free end at the inward side of the member and projecting from the wall portion along the axis in a direction away from the outward side of

the member, with the tube portion containing the bore as an open ended internal bore therethrough,

an actuator operatively freely slidably mounted on the projecting tube free end and substantially concentric to the bore for pivotal movement about the axis at an axial activating position on the tube free end and for deviating axial movement from the axial activating position to a deactivating position off of the tube free end and out of operatively mounted relation therewith,

resilient urging means arranged for urging the actuator off of the tube free end to the deactivating position, and

a pivotal force transmitting shaft of substantially curved cross section having a head end substantially axially operatively connected to the actuator for conjoint movement of the actuator and shaft relative to the member, and a tail end at the outward side of the member and selectively remote from the actuator and member and arranged for attachment under tension at a corresponding remote reference point for maintaining the actuator at the axial activating position against the force of the urging means and for receiving a pivotal force applied to the tail end at the reference point for pivoting the shaft and actuator,

whereby upon disturbing the tension attachment disposition of the tail end at or relative to the reference point the urging means will urge the actuator to the deactivating position.

4,426,859

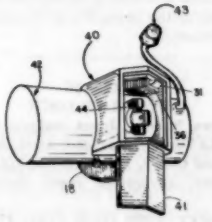
ANTI-THEFT AUTO LOCK

Herbert R. Floyd, 420 E. 105 St. #2-H, New York, N.Y. 10029

Filed Jul. 20, 1981, Ser. No. 284,974

Int. Cl.³ B60R *25/00;* **E05B** *11/00, 17/14, 65/12*

U.S. Cl. 70—18 **3 Claims**



1. An anti-theft auto lock for providing authorized access to an auto ignition switch mounted on the steering column of a vehicle with avoidance of removal of said anti-theft lock from said steering column; said steering column being substantially cylindrical in shape and having a first axis, and said ignition switch having a still segment fixed to said steering column and a movable segment rotatable with respect to said stationary segment about a second axis substantially perpendicular to said first axis and spaced from said stationary segment to define an annular hiatus therebetween; said auto lock comprising

(a) a boxy shaped housing having one end surface shaped to join with and conform to the side of the circumference of said steering column completely encasing the side of said steering column in the vicinity of said ignition switch,

(b) means in said housing for engaging an enclosure, composed of a latch comprising an aperture having a handle secured therein for moving said latch in opposition to a spring for disengaging one end of an arcuate enclosure member having the other end thereof secured to the exterior bottom surface of said housing pivotally connected thereto, and

(c) means for controlling said pivotally connected arcuate member having an obliqued surface for said engaging with an obliqued surface of said latch, whereby latching may be accomplished manually, however,

(i) the said housing comprises an access opening and a closure for such access opening comprising a sliding door which moves up and down within at least one furrow manifested beneath the surface of at least one interior wall within said housing, serving as a bearing, and

(ii) means for guiding said door into engagement with a conventional key operated spring lock defining a second latch mounted within said housing, whose latching is accomplished by having the index finger of said authorized hand placed underneath said door with the palm portion of said hand facing up, and subsequently pushing said door upward in a thrusting motion consequently pressuring said second latch in said opposition to said spring, and said spring sending said second latch on a short course of travel in a brief space of time into an aperture in the interior portion of said door positioned near the top thereof, consequently locking said door of said housing with avoidance of removal of the ignition key from said ignition switch.

4,426,860

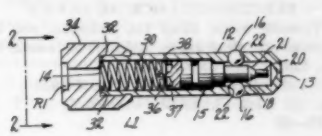
LOCK AND KEY SYSTEM OF THE PLUNGER TYPE

James Swisher, Box 248, Southport, Conn. 06490

Filed Jul. 9, 1981, Ser. No. 281,701

Int. Cl.³ E05B *67/36*

U.S. Cl. 70—34 **9 Claims**



1. In combination, a lock of the plunger operated type comprising a hollow housing having a head with an aperture receiving an axially movable operating plunger having an engagable end and an operating key with a head and an elongated plunger-engaging mechanism projecting forwardly from the head for entering the lock aperture, said lock head having a recess of predetermined depth disposed around said aperture, and said key having a spacer projecting forwardly of the head a distance substantially equal to the depth of the recess of the lock.

4,426,861

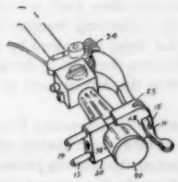
BRAKE LOCK FOR MOTORCYCLES AND THE LIKE

Robert L. Chillis, 10555 National Blvd. #203, Palms, Calif. 90034

Filed Aug. 13, 1981, Ser. No. 292,588

Int. Cl.³ B60R *25/02;* **B62H** *5/04;* **E05B** *67/22;* **G05G** *5/00*

U.S. Cl. 70—39 **11 Claims**



1. A locking bracket for a motor bike and the like of the type having at least one brake handle located proximately adjacent a handle of the bike and adapted to be gripped by a rider toward the bike handle to apply a braking force to at least one of the bike's wheels, the bracket comprising:

a U-shaped shackle formed with a pair of substantially parallel legs with a top end connecting said legs and an opposite open end;

a member defining a first slot, said first slot being substantially U-shaped, whereby said member is slidable on the two legs of said shackle toward the top thereof, said member defining a second slot extending downwardly from its top end, whereby when said member is in its most upward position on said shackle near the top of the shackle an opening is formed between the bottom side of said second slot and the top of said shackle, said opening being large enough to surround the bike's brake handle; and

locking means slidable on the legs of said shackle, for locking said shackle on the bike, whereby said top of said shackle urges said brake handle toward said bike handle to apply braking power to said bike, and said member being pressed between the brake handle and the bike handle, with said locking means having one side pressed against said bike handle.

4,426,862

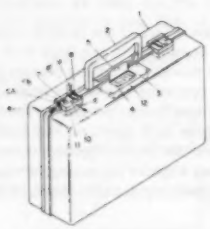
ELECTRONIC LOCKING DEVICE

Noboru Yamada, Suita; Kenji Iio, Fukuoka, and Kazuyuki Shiiba, Machida, all of Japan, assignors to Iwasaki Engineering Co., Ltd., Kyoto, Japan

Filed Jul. 6, 1981, Ser. No. 280,925

Int. Cl.³ E05B *47/00, 65/52*

U.S. Cl. 70—69 **2 Claims**



1. An electronic locking device including an electronic control unit which operates a driving unit by a code input from outside and having a locking position and an unlocking position comprising:

(a) an unlocking member moving freely by manual operation of an unlocking knob connected to the unlocking member, wherein, when the code input is given, the unlocking member and the unlocking knob are selectively operated from outside, the unlocking member having first interlocking means for being restrained by a moving piece of the driving unit when the locking device is in the locking position and when the driving unit is in a non-operated condition;

(b) a retaining mechanism traversing freely with respect to the unlocking member and having second interlocking means for restricting the moving piece, wherein, both the first and second interlocking means are aligned when the locking device is in the locking position, and both the first and second interlocking means are misaligned when the locking device is in the unlocking position; and

(c) an operation knob for releasing the restriction of the moving piece when the driving unit is in the non-operated condition.

4,426,863

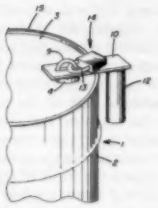
CONTAINER SECURING DEVICE

Jeffrey L. Gillette, Pittsburgh, and Donald W. Hillery, Lower Burrell, both of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Nov. 9, 1981, Ser. No. 319,853

Int. Cl.³ B65D *55/14*; F16B *41/00*

U.S. Cl. 70—164 **10 Claims**



1. A securing device for a container which container has a wall and a substantially closed and, the substantially closed end having a hole defined by a receptacle having means for rotatably receiving a bung, said securing device comprising: a bung having a wall provided with means for rotatably engaging the receptacle and an upper end having an outwardly projecting member rigid with said upper end, said outwardly projecting member having an aperture adapted for receiving a lock; and an elongated locking plate having a closed slot near one end for receiving said projecting member and a second member in longitudinal relation to said slot rigid with said locking plate and projecting from the surface thereof for engaging the outside wall of, and/or the perimeter of the substantially closed end of, the container.

4,426,864

CYLINDER LOCK

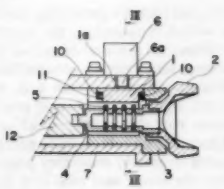
Minoru Morikawa, Nagoya, Japan, assignor to Kabushiki Kaisha Tokai Rika Denki Seisakusho, Aichi, Japan

Filed Oct. 9, 1981, Ser. No. 310,366

Claims priority, application Japan, Oct. 13, 1980, 55-146273[U]

Int. Cl.³ E05B *17/00, 33/00, 47/00*

U.S. Cl. 70—431 **6 Claims**



1. A cylinder lock which can be unlocked either by using a key or without using a key, said cylinder lock comprising:

a rotor casing having a groove in the inner surface of a side wall of said rotor casing and extending parallel to the axis of said casing, and further having an elongated through opening in the side wall of said rotor casing communicating with said groove;

a rotor rotatably received in said rotor casing and having a keyhole therein and having a knob fixedly provided on the outer end thereof;

tumblers slidably fitted into said rotor and having projecting ends selectively engaged in and disengaged from said groove when a key is withdrawn from and inserted into said keyhole, respectively;

a tumbler blocking member slidably positioned in said elongated through-opening in said rotor casing;

a plunger driving device mounted in a predetermined position on the outer surface of said side wall of said rotor casing and having a plunger driven thereby and opposed to said tumbler blocking member, whereby said tumblers are pushed into said rotor by said tumbler blocking member when said plunger is thrust towards said tumbler blocking member by said plunger driving device and said projecting ends of said tumblers are disengaged from said groove in said rotor casing for permitting said rotor to be turned by turning said knob.

4,426,865

APPARATUS FOR LUBRICATING TOOLS ON METAL EXTRUSION PRESSES

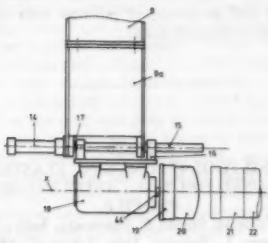
Alfred Steinmetz, Schiefbahn; Klaus Exner, and Dieter Welters, both of Dusseldorf, all of Fed. Rep. of Germany, assignors to SMS Schloemann-Siemag Aktiengesellschaft, Dusseldorf, Fed. Rep. of Germany

Filed Oct. 14, 1981, Ser. No. 311,170

Claims priority, application Fed. Rep. of Germany, Oct. 30, 1980, 3040886

Int. Cl.³ B21C *23/32*

U.S. Cl. 72—44 **9 Claims**



1. In a metal-extrusion press having at least one extrusion tool defining an extrusion axis, and a press frame for supporting said tool, a lubricating device for lubricating said at least one tool, comprising a support arm having a free end, means for mounting said support arm on said press so that said free end is movable towards and away from said extrusion axis, means to operate said support arm, a carrier, means to mount said carrier slidably on said support arm free end for movement parallel to said extrusion axis, a receptacle for at least one candle of solid heat-meltable lubricant, means to support said receptacle on said carrier, means to support said at least one candle on said receptacle, and means to move said carrier so that in operation an end of said candle is engageable with said extrusion tool for lubricating said tool.

4,426,866

DELIVERY SYSTEM FOR BALL PEENING OR FORMING APPARATUS

Larry S. Klass, Nashville, Tenn., assignor to Avco Corporation, Greenwich, Conn.

Filed Feb. 2, 1981, Ser. No. 230,728

Int. Cl.³ B21J *1/02*; B24B *39/00*; B65G *25/00, 17/48*

U.S. Cl. 72—53 **1 Claim**

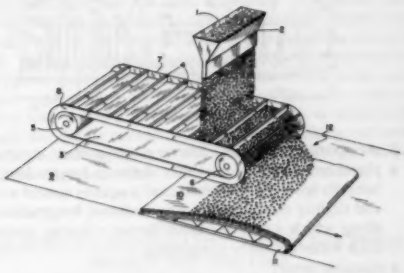
1. Apparatus for delivering media to a work station for the purpose of working the surface of a deformable metal workpiece comprising:

a work station;

a conveyor belt mounted about rotating members above said work station for moving working media carried thereby in a first direction towards the work station, said conveyor belt constructed to turn downward about one of said rotating members at a height above the work station which is sufficient to allow a significant acceleration by gravity to said media dispensed therefrom;

means mounted forward of the work station and said downward turn of said conveyor belt for supplying said working media to the conveyor belt for movement thereon;

paddle elements mounted on the conveyor belt transverse to the first direction of movement and projecting outward therefrom to engage the media;



means operatively associated with the rotating members to drive the conveyor belt and thereby move said media in said first direction toward the work station at a speed sufficient to allow the paddles to impart an additional downward acceleration to the working media as the belt turns downward over the work station; and

means to move a workpiece into the work station under the path of the working media dispensed by the conveyor belt.

4,426,867

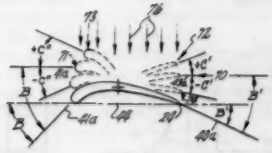
METHOD OF PEENING AIRFOILS AND THIN EDGED WORKPIECES

James W. Neal, Columbia, and Joseph F. Loersch, Bolton, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Sep. 10, 1981, Ser. No. 300,718

Int. Cl.³ B21J *00/00*

U.S. Cl. 72—53 **5 Claims**

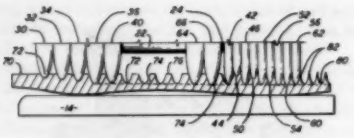


1. The method of peening the edge of a workpiece comprising directing a stream of shot along a substantially collimated path, characterized by rotating the centerline of the workpiece edge through an angle C with respect to the normal to the shot path, said angle C being less than 90 degrees, and sufficient to cause oblique impacts at the tangent to the centerline of the edge, but insufficient to cause impacts normal to said tangent, the oblique impacts at points on the edge causing a residual compressive stress along said centerline.

4,426,868
APPARATUS AND METHOD FOR FORMING FINS ON A TUBE SURFACE

Matti J. Tornisinen, Gloversville, N.Y., assignor to Carrier Corporation, Syracuse, N.Y.

Filed Jan. 13, 1982, Ser. No. 339,027
Int. Cl.³ B21H 3/04
U.S. Cl. 72—98 6 Claims

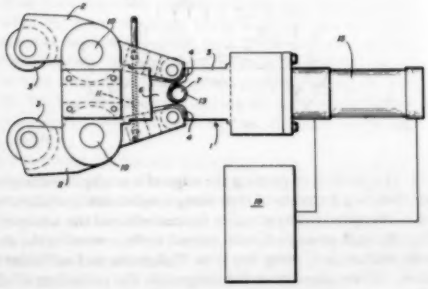


1. Apparatus for forming fins on a tube surface comprising
a plurality of roller assemblies defining longitudinal axes laterally spaced from, substantially equally spaced around, and slightly skewed relative to a central, longitudinal axis along which a tube advances during a finning operation, each roller assembly comprising:
a rotatable arbor;
a plurality of discs mounted on the arbor for rotation therewith, and including
a first set of discs having substantially uniform widths, and progressively increasing outside diameters in a forward direction, and
a second set of discs having substantially uniform widths generally equal to half the width of each disc in the first set of discs, located forward of the first set of discs, and including a first subset of discs having outside diameters generally equal to the outside diameter of the forwardmost disc in the first set of discs, and a second subset of discs alternating with the first subset of discs and having progressively increasing outside diameters in the forward direction, with the outside diameter of the forwardmost disc in the second subset of discs generally equal to the outside diameter of the forwardmost disc in the first set of discs; and
spacing means mounted on the arbor between the first and second sets of discs.

4,426,869
RADIAL INFEED THREAD ROLL ATTACHMENT

Robert M. Farmer, Marlboro, and Brian R. Faucher, Paxton, both of Mass., assignors to Litton Industrial Products, Inc., Holden, Mass.

Filed Jun. 1, 1982, Ser. No. 383,477
Int. Cl.³ B21H 3/04
U.S. Cl. 72—104 3 Claims

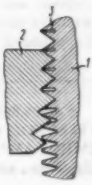


1. A radial infeed thread roll attachment comprising
a pair of jaw elements each having means for mounting a thread roll at one end and a roller secured on the other end,
a housing,
means for pivotally mounting said jaw elements in opposed relation on said housing,
a cam assembly having an inner portion having a flat wedge-shaped cam element at one end and a threaded member at the other end and an outer portion,
means for mounting said cam assembly on said housing,
spring means for forcefully maintaining said rollers in engagement with said cam element for preventing the rotation of said inner portion when said outer portion is rotated whereby rotation of said outer portion will result in the axial displacement of said inner portion relative to said outer portion,
said outer portion having an outer axially fixed element and an inner axially displaceable element threadedly related to said inner portion threaded member, said outer element having an axially extending keyway and said inner element having an axially extending key, and
cylinder means including a hydraulic cylinder with an air-on-oil hydraulic booster,
means for securing said cylinder means to said inner element for axially displacing said inner element and said threadedly related inner portion a fixed distance between a retracted and an advanced position with no rotational displacement therebetween.

4,426,870
METHOD AND TOOL FOR MAKING ELASTIC THREAD HAVING CLOSED HELICAL CAVITY INSIDE THREAD PROFILE

Gennady A. Toropov; Stepan P. Shamenko, both of Dnepropetrovsk; Georgy L. Tsvirko, Tula; Viktor G. Oleinichenko, Dnepropetrovsk; Georgy A. Khitun, and Anatoly I. Menyailenko, both of Taganrog, all of U.S.S.R., assignors to Dnepropetrovsky Gorny Institut Imeni Artema, Dnepropetrovsk, U.S.S.R.

PCT No. PCT/SU80/00118, § 371 Date Mar. 30, 1981, § 102(e) Date Mar. 30, 1981, PCT Pub. No. WO81/00365, PCT Pub. Date Feb. 19, 1981
PCT Filed Jun. 30, 1980, Ser. No. 247,296
Claims priority, application U.S.S.R., Jul. 31, 1979, 2804079
Int. Cl.³ B21H 3/08
U.S. Cl. 72—118 2 Claims



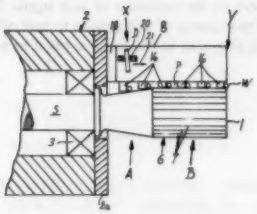
1. A method of making an elastic thread having a closed cavity inside the thread profile by plastically deforming the walls of a performed helical groove by means of a thread-forming tool, said method comprising forming a helical groove to define a symmetrical thread profile having at least a double-start and having a pitch equal to that of the thread being formed, one of said starts serving for directing the thread-forming tool, and plastically deforming the walls of the helical groove into a closed helical thread having a cavity disposed inside the thread profile by moving a thread forming tool along said groove so that spaced starts are transformed into a cavity.

4,426,871

APPARATUS FOR PRODUCING HELICAL WIRE COILS

Paul Fabrig, Neuffen, Fed. Rep. of Germany, assignor to Womako Maschinenkonstruktionen GmbH, Nürtingen, Fed. Rep. of Germany

Filed Nov. 16, 1981, Ser. No. 321,809
Claims priority, application Fed. Rep. of Germany, Nov. 15, 1980, 3043171
Int. Cl.³ B21F 3/04
U.S. Cl. 72—141 10 Claims



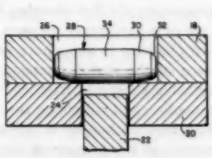
1. Apparatus for producing a helical wire coil, particularly a coil which is to be subdivided into spiral binders, comprising a rotary mandrel having a substantially frustoconical section and a substantially cylindrical section, said frustoconical section having a larger-diameter end adjacent to and a smaller-diameter end remote from said cylindrical section; means for rotating said mandrel; stationary guide means adjacent to said mandrel and defining a helical path whose lead at least approximates the desired lead of the coil, said path extending around said sections and having an inlet in the region of said frustoconical section so that successive increments of the wire first contact said frustoconical section; and means for supplying a length of wire into said inlet so that the wire advances along said path and is convoluted first around said frustoconical section and thereupon around said cylindrical section.

4,426,872

DIE SET AND BILLET FOR USE THEREIN

David A. Gatny, Warren, Mich., assignor to W-F Industries, Inc., Center Line, Mich.

Filed Sep. 30, 1981, Ser. No. 307,156
Int. Cl.³ B21J 13/02
U.S. Cl. 72—359 9 Claims



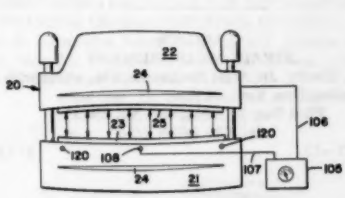
1. A method of making a curved part comprising the steps of preparing a billet of axi-symmetrical configuration, preforming said billet so that its volume is substantially equal to the volume of said part, pre-forming said billet with an overall length Y and a central portion of length L both measured along its axis and a dimension D_1 transverse to its axis through its length L, pre-forming said billet with dimension D_2 transverse to its axis at each end thereof, said dimension D_2 being smaller than said dimension D_1, pre-forming said billet with end portions transitioning between the dimension D_1 at the ends of the length L to the dimensions D_2 at the ends of the overall length Y, preparing female die means for forming said curved part in a die cavity formed in said female die means, dimensioning said die cavity with an overall length Y substantially equal to the overall length Y of said billet but slightly larger to permit entry of said billet into said die cavity, said part and said die cavity being curved in a plane containing the axis of said billet when said billet is in said die cavity, said die cavity being further defined by a width W and curved surfaces defined by radii R_1 and R_2, said billet dimension D_1 being less than said cavity dimension W, said billet dimension L being in the range of greater than zero and less than dimension Y, inserting said billet into said die cavity with its axis substantially perpendicular to the axis of the forging stroke of punch means into said cavity, heating said billet to a warm forming temperature, using punch means to form said heated billet in said cavity into said part with a single stroke of said punch into said cavity to produce said part as a flashless part, said plane in which said part and said die are curved and the plane containing said radii R_1 and R_2 both being located substantially at right angles to the line defined by the stroke of said punch into said cavity.

4,426,873

DEFLECTION COMPENSATING MEANS FOR PRESS BRAKES AND THE LIKE

Eugene W. Pearson, Pebble Beach, and Arthur L. Pedersen, Oakland, both of Calif., assignors to Canron Corporation, Oakland, Calif.

Filed Apr. 16, 1982, Ser. No. 369,183
Int. Cl.³ B21D 5/02
U.S. Cl. 72—389 14 Claims



1. A device to compensate for deflection of a beam to support an elongated die comprising:

a. a elongated wedge tapering across its width to provide a thick edge and a thin edge,

b. means providing an inherently graded flexibility along the length of the wedge, said means providing greater flexibility toward the ends of the wedge,

c. a wedge supporting surface between said beam and said die,

d. a restraint engaged with each end of said wedge, said restraint positioned to limit the movement of said wedge between the beam and the die, and

e. means for exerting force horizontally against the thick edge of said wedge and toward the thin edge of said wedge, said force being applied intermediate the restrained ends of said wedge.

4,426,874

STRAIN GAGE CALIBRATION

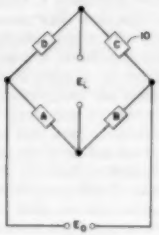
Thomas C. Moore, Poquoson, Va., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Apr. 27, 1982, Ser. No. 372,279
Int. Cl.³ G01L 25/00
U.S. Cl. 73—1 B 3 Claims

1. A method of calibrating strain gages for transducer applications comprising:

securing a reference strain gage to a test block;

adhesively attaching a plurality of strain gages to be calibrated to the test block;
connecting at least one thermocouple to the test block for monitoring temperature;
coupling the reference gage and a plurality of strain gages to a data acquisition system;
subjecting the test block and attached apparatus to a predetermined temperature excursion;



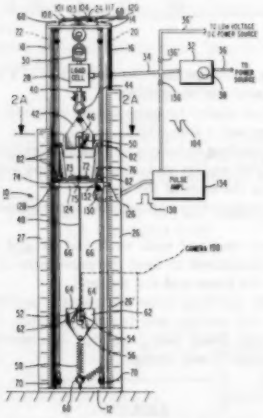
collecting strain gage response data throughout the temperature excursion;
matching the strain gages through data comparison of the strain gage response data;
removing the plurality of adhesively attached strain gages from the test block; and
decoupling and cleaning the strain gages to prepare them for permanent installation on transducers.

4,426,875

STRAIN MEASUREMENT

Edward L. Crosby, Jr., West Melbourne, Fla., assignor to RCA Corporation, New York, N.Y.

Filed Dec. 14, 1981, Ser. No. 330,377
Int. Cl.³ G01N *3/30*
U.S. Cl. 73—12 **17 Claims**



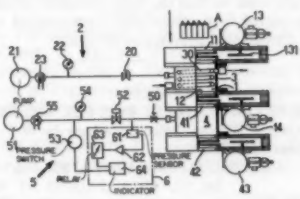
3. An apparatus for determining the strain imparted to an article in response to a stress applied between first and second parts of the article comprising:
means for fixing to a point of reference said first part of the article;
means for applying an impact force to said article at the second part thereof for stressing and thereby straining said article between said two parts thereof;
signal generator means including a radiating source in fixed spaced relation, at least during the application of the impact force, to one of said parts of said article for generating a radiating signal in response to stress applied to said article, the source moving relative to the other part of said article in response to the strain of said article caused by said force applied to said article, said signal generator means including a means responsive to the stress applied to said article for turning on said radiating source when said stress exceeds a given value and for turning off said radiating source when said stress is lower than said given value; and
means responsive to the radiation of said signal for sensing said relative movement of said source to said other part of said article in response to the force applied to said article.

4,426,876

METHOD AND APPARATUS FOR CHECKING SEALED CONTAINERS FOR PINHOLES

Michio Kakumoto, Naruto, Japan, assignor to Otsuka Pharmaceutical Factory, Inc., Japan

PCT No. PCT/JP80/00193, § 371 Date May 3, 1981, § 102(e) Date May 1, 1981, PCT Pub. No. WO81/00765, PCT Pub. Date Mar. 19, 1981
PCT Filed Aug. 22, 1980, Ser. No. 261,188
Claims priority, application Japan, Sep. 3, 1979, 54-113295; Sep. 3, 1979, 54-113296
Int. Cl.³ G01M *03/32*
U.S. Cl. 73—49.3 **9 Claims**

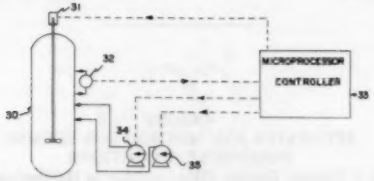


1. A method of checking sealed containers for pinhole leaks therein, said containers having a vaporizable substance enclosed therein and said method being characterized by placing the sealed container into a first chamber, hermetically closing the first chamber, evacuating the first chamber to a a predetermined vacuum by use of a vaporizing vacuum suction means connected to the first chamber to vaporize a vaporizable substance off the surface of the sealed container, substantially removing the vaporizable substance from the surface of the sealed container by cooling and collecting the vaporized substance with a cooling heat exchanger in the heat exchanger relationship with respect to the interior of the first chamber, thereafter placing the sealed container into a second chamber connected to the first chamber hermetically closing the second chamber, evacuating the second chamber to a predetermined vacuum by measuring vacuum suction means connected to the second chamber, thereafter interrupting the evacuation of the second chamber, measuring increase of the pressure within the second chamber, and comparing the increased pressure with a predetermined standard pressure value, whereby an indication is provided that the container has a pinhole leak when the increased pressure value is not lower than said predetermined standard pressure value and an indication is provided that the container has no pinhole leak when the increased pressure value is lower than the standard pressure value.

4,426,877
METHOD AND APPARATUS FOR RECOVERING OIL FROM WASTE OIL EMULSION

Sanjay R. Srivatsa, 1620 Bay Ct., Naperville, Ill. 60565, and Edwin C. Zuerner, Jr., 450 Van Gogh, Bolingbrook, Ill. 60439

Filed Mar. 3, 1982, Ser. No. 354,172
Int. Cl.³ G01N *11/00*
U.S. Cl. 73—54 6 Claims



4. A method of predicting oil-water resolutions in waste oil emulsion recovery systems comprising the steps of, heating a waste oil emulsion sample to the operating temperature of the system, conducting bottle tests on the sample which includes dividing the waste oil emulsion sample into a plurality of substantially equal relatively small waste oil emulsion quantities, adding and mixing in variable amounts of acid to the waste oil emulsion quantities, visually observing the viscosities of each quantity, adding and mixing variable quantities of emulsion breaker to said mixtures of waste oil emulsion and acid, observing the viscosities of each final mixture, conducting a beaker test by scaling up the bottle test and placing several times the bottle quantity of the heated sample into a beaker, mixing the sample until a constant viscosity is obtained and measuring the viscosity with a viscometer, adding and mixing in a quantity of acid as determined from the bottle test to produce the desired viscosity, measuring the viscosity of the mixture of the sample and acid, adding and mixing in a quantity of emulsion breaker determined from the bottle test to produce the desired viscosity, and measuring the viscosity of the mixture of the sample, acid and emulsion breaker, thereby developing a trend depicting the drop in viscosity as a function of the type and dosage of acid and emulsion breaker added.

4,426,878
VISCOSIMETER

John G. W. Price, Dallas, Tex., and Rene Cloarec, Paris, France, assignors to Core Laboratories, Inc., Dallas, Tex.

Filed Oct. 13, 1981, Ser. No. 310,657
Int. Cl.³ G01N *11/04*
U.S. Cl. 73—55 8 Claims

1. A viscosimeter for determining the viscosity of a fluid sample, the viscosimeter comprising, in combination:

a first cell containing a body of electrically conductive incompressible fluid;

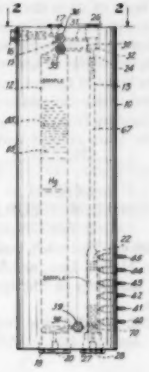
an elongated second cell containing a fluid sample, the second cell having an axis in juxtaposition with the first cell, the fluid sample having a significantly smaller specific gravity than said conductive fluid;

a capillary passage interconnecting the first cell and one end of the second cell;

an additional passage interconnecting the first cell and the other end of the second cell, to form a closed circuit comprising said first and second cells and said passages;

valve means disposed in said additional passage;

sensing means including a plurality of electrodes extending into the second cell in axial spaced relationship with each other along said second cell, the opening of said valve means permitting flow of said electrically conductive fluid from said first cell through said additional passage and into sequential contact with the electrodes in said second cell, and permitting flow of said fluid sample from said second cell through said capillary passage into said first cell; and

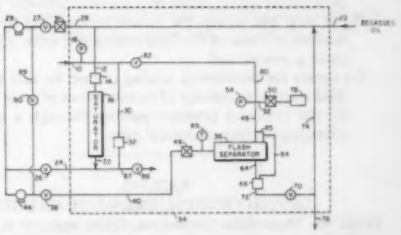


circuit means electrically connected to said electrodes for detecting the rate of movement of a top surface of the conductive fluid past said electrodes and for producing an output signal representing the viscosity of the sample.

4,426,879
METHOD AND APPARATUS FOR DETERMINING THE FOAMING CHARACTERISTICS OF CRUDE OIL

Curtis L. Humphries, Duncanville; Eddie F. Schultz, Arlington, and Alan M. Winkelman, Dallas, all of Tex., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Jun. 21, 1982, Ser. No. 390,098
Int. Cl.³ G01N *33/28*
U.S. Cl. 73—60.1 9 Claims



1. A method for measuring the foaming characteristics of oil comprising:

(a) saturating a predetermined volume of oil with a gas inert with the oil at a predetermined pressure and temperature;

(b) introducing said gas-saturated oil at a predetermined rate into one end of a flash separator comprising an elongated horizontal transparent vessel, said flash separator maintained at a predetermined pressure substantially lower than the gas saturation pressure so that the gas saturated oil upon exposure to the reduced pressure separates into a gaseous portion that passes to the upper portion of the separator, a body of oil that extends along the bottom of the separator and a layer of foam that accumulates on top of the oil;

(c) controlling the temperature of the flash separator at a temperature equal to the gas saturation pressure;

(d) withdrawing gas from the upper portion of the flash separator near the end opposite the oil inlet and measuring the gas flow rate;

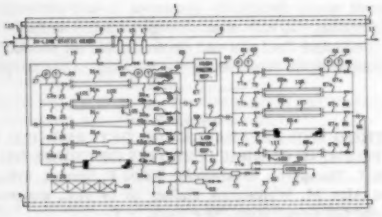
(e) withdrawing oil from the bottom portion of the flash separator near the end opposite the oil inlet and measuring the oil flow rate;
(f) maintaining a layer of oil in the lower portion of the flash separator at a controlled level by means of a weir extending from the bottom of the separator located between the oil inlet and the oil outlet of the separator;
(g) preventing the layer of foam accumulating on the top of the oil from passing beyond said weir by means of a transverse baffle extending from the top of the separator; and
(h) determining the foam volume within the flash separator.

4,426,880

METHOD AND APPARATUS FOR FLUID SAMPLING AND TESTING

John P. Walters; Radomir Petrovich, both of Bartlesville, Okla.; Gregory C. Daley, Dallas, Tex., and Donald C. Harban, Salt Lake City, Utah, assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Jul. 24, 1981, Ser. No. 286,310
Int. Cl.³ G01N *17/00*
U.S. Cl. 73—61.2 **10 Claims**



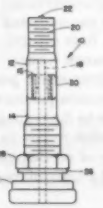
1. An apparatus for preparing and testing geothermal fluid samples comprising:
(a) means for homogenizing a two-phase fluid mixture of geothermal liquid, steam and non-condensable gases,
(b) at least one means for isokinetic sampling arranged to remove portions of the fluid discharged from said homogenizing means, and
(c) means for monitoring scaling caused by said two-phase fluid mixture consisting of measurement of scale deposited by the removed portions passing through a constantly enlarging section of conical pipe.

4,426,881

LIQUID CRYSTAL PRESSURE GAUGE

David M. Magoulick, Uniontown, Ohio, assignor to National Distillers and Chemical Corporation, New York, N.Y.

Filed Jul. 14, 1982, Ser. No. 397,952
Int. Cl.³ G01L *7/08*
U.S. Cl. 73—146.8 **9 Claims**



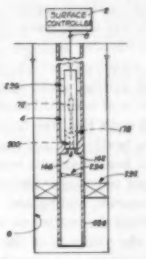
1. A pressure gauge comprising a pressure chamber which is provided with access to a pressure being measured, said pressure chamber including a substantially transparent window means for viewing therethrough, and at least one liquid crystal mounted within said transparent window means in said pressure chamber to be subjected to the pressure being measured, said liquid crystal being directly responsive to different pressures to provide different visual appearances which thereby provide a visual reading of the measured pressure.

4,426,882

APPARATUS AND METHOD FOR SENSING DOWNHOLE CONDITIONS

Neal G. Skinner, Duncan, Okla., assignor to Halliburton Company, Duncan, Okla.

Filed Dec. 2, 1981, Ser. No. 326,540
Int. Cl.³ E21B *47/06*
U.S. Cl. 73—155 **41 Claims**

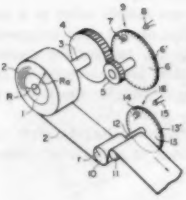


1. An apparatus for sensing pressure in a well, comprising:
a housing including a driving fluid chamber, an accumulator chamber and having valve means disposed therein, a first opening defined therein for introducing a fluid from the well into the interior of said housing, a second opening defined therein for passing fluid from the interior to the exterior of said housing, and a passageway defined in the interior of said housing for connecting said first opening with said second opening, first conduit means communicating with a first portion of said valve means, second conduit means communicating with a second portion of said valve means;
valve drive means, disposed in said housing, for moving said valve means between a closed position wherein the fluid in the well is prevented from flowing from said first opening to said second opening and an open position wherein the fluid in the well is allowed to flow from said first opening to said second opening, said valve drive means including second valve means for switchably communicating either said third circuit means with said first conduit means and said second conduit means with said accumulator chamber or said third conduit means with said second conduit means and said first conduit means with said accumulator chamber so that said valve means is placed either in said closed position or said open position;
pressure sensing means, disposed in said housing, for sensing the pressure in the well both when said valve means is in its closed position and when said valve means is in its open position; and
electronic means, disposed in said housing and responsive to said pressure sensing means, for communicating a signal corresponding to the magnitude of the sensed pressure to a location spaced from said housing.

4,426,883
WEB ROLL AMOUNT DETECTING APPARATUS

Shunzo Inoue; Takeshi Nagasawa, both of Yokohama; Toshio Iwaya, Shiki; Michio Kasuya, Fuchu, and Shinji Murata, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 15, 1982, Ser. No. 339,518
Claims priority, application Japan, Jan. 30, 1981, 56-12476
Int. Cl.³ G01B 7/04
U.S. Cl. 73—159 10 Claims

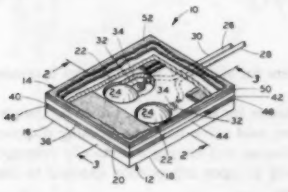


1. A web roll amount detecting apparatus for detecting the length of web wound on a bobbin, said apparatus comprising:
- first detector means for detecting the amount of rotation of the bobbin;
- second detector means for detecting the amount of feed of the web;
- means for setting a factor including the radius of the bobbin and the thickness of the web; and
- operation means for calculating the length of the web wound on the bobbin based upon the amount of rotation detected by said first detector means, the amount of feed detected by said second detector means within a predetermined time period and the factor set by said setting means.

4,426,884
FLEXIBLE FORCE SENSOR

Michael Polchaninoff, Huntington, N.Y., assignor to The Langer Biomechanics Group, Inc., Deer Park, N.Y.

Filed Feb. 24, 1982, Ser. No. 351,961
Claims priority, application United Kingdom, Feb. 1, 1982, 8202830
Int. Cl.³ A61B 5/00; H01C 10/10
U.S. Cl. 73—172 24 Claims

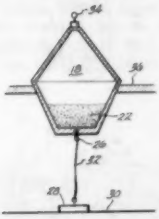


1. A sensor comprising a member of dielectric material defined by inner and outer faces,
- electrical contact means on said member with a portion of said contact means substantially aligned with said inner face of said dielectric member, said electrical contact means being substantially non-compressible and of fixed conductivity, and
- a flexible conductive member defined by inner and outer faces, the inner one of which is attached to the face of said dielectric member to cover said electrical contact means such that, when a compressive load is applied to the sensor, the load induces an increase in the surface area of contact between facing portions of said conductive member and said contact means to effect a change in the electrical resistance thereacross in proportion to the extent of the applied load and independent of the location over the electrical contact means at which the load is applied.

4,426,885
DEVICE FOR INDICATING THE THICKNESS OF ICE

John Visco, 334 Jeffer St., Ridgewood, N.J. 07450

Filed Sep. 9, 1982, Ser. No. 416,218
Int. Cl.³ G01B 5/02
U.S. Cl. 73—432 R 8 Claims



1. A device for indicating the thickness of an ice layer on the surface of a body of water comprising a hollow, watertight body, said hollow, watertight body having a ballasting medium positioned within said hollow, watertight body for allowing said hollow, watertight body to float on the surface of said body of water at a predetermined height, and indicia means provided on the external surface of said hollow, watertight body whereby said hollow, watertight body is biased upwards by the force of an ice layer being formed on the surface of said body of water such that the thickness of the ice layer formed is indicated by the indicia on said hollow, watertight body.

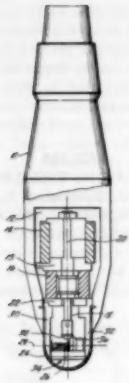
4,426,886
ULTRASONIC SCANNER

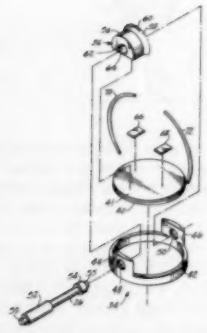
P. Michael Finsterwald, and LeRoy Kopel, both of Tempe, Ariz., assignors to Advanced Diagnostic Research Corporation, Tempe, Ariz.

Filed Nov. 9, 1981, Ser. No. 319,448
Int. Cl.³ G01N 29/04
U.S. Cl. 73—633 24 Claims

1. A mechanical ultrasonic scanner comprising:
- a motor having an output shaft that oscillates about an output axis;
- a first bevel gear having teeth mounted on the end of the output shaft;
- an ultrasonic transducer spaced from the end of the output shaft, the transducer having a front radiating surface and a back mounting surface;
- a second bevel gear mounted on the back surface of the transducer, the second gear having gear teeth distributed in an arc less than completely around an axis of rotation such that the back surface of the transducer is spaced nearer to the axis of rotation than those teeth of the second gear located diametrically opposite the back surface; and

means for rotatably supporting the transducer and the second gear for rotation about the axis of rotation with the





gear teeth of the first and second gears in engagement and the axis of rotation transverse to the output axis.

4,426,887

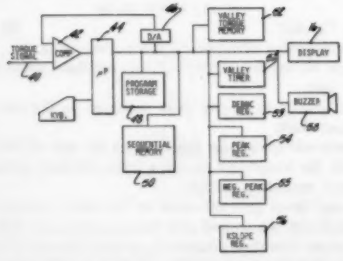
METHOD OF MEASURING PREVIOUSLY APPLIED TORQUE TO A FASTENER

James H. Reinholm, Livonia, and Eugene J. Marcinkiewicz, Plymouth, both of Mich., assignors to GSE, Inc., Farmington Hills, Mich.

Continuation-in-part of Ser. No. 372,878, Apr. 29, 1982. This application Jan. 7, 1983, Ser. No. 456,214

Int. Cl.³ B25B *23/142*; G01L *5/24*

U.S. Cl. 73—862.23 **6 Claims**



6. In a method of detecting breakaway torque levels associated with the amount of previously applied torque to a fastener, wherein torque is subsequently applied to the fastener in the tightening direction until further motion of the fastener is obtained, and wherein an analog signal is generated as a function of the subsequently applied torque, the improvement comprising:

(a) sampling the analog signal and converting it into a plurality of digital sample values;

(b) storing said sample values in sequential memory locations;

(c) comparing the slopes of segments of said digital samples with a preselected slope;

(d) selecting a given sample value as a coarse breakaway point as a function of said slope comparisons;

(e) calculating the arc tangent for digital sample values adjacent said coarse breakaway digital sample;

(f) selecting the digital sample value having the minimum arc tangent; and

(g) displaying said selected digital sample value as an indication of the amount of previously applied torque to the fastener.

4,426,888

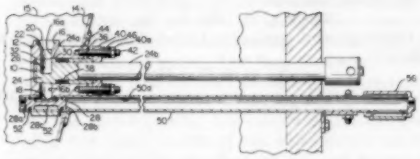
APPARATUS FOR SAMPLING MATERIAL FROM A REMOTE LOCATION

Russell G. Smith, Cincinnati, Ohio, assignor to Xomox Corporation, Cincinnati, Ohio

Filed Jul. 30, 1981, Ser. No. 288,465

Int. Cl.³ G01N *1/10*

U.S. Cl. 73—863.83 **10 Claims**



1. A system for sampling material from a remote location, comprising:

(a) a container for housing material to be sampled;

(b) a valve, said valve having a housing disposed inside of the container and having a vertically oriented flow passage with an open top portion exposed to the container contents;

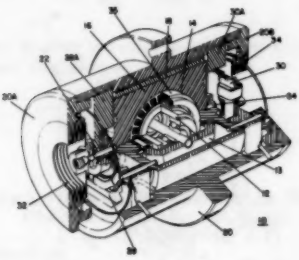
(c) a movable valving member disposed within said valve housing, said valving member having a recess which is in selective alignment with said flow passage, said valving member being movable from a first position for receiving the material to be sampled in which the recess is in alignment with the top portion of the flow passage to a second position for discharging the material to be sampled in which said recess is in alignment with the bottom portion of the flow passage; and

(d) a carrier selectively positioned beneath the movable valving member for receiving material discharged from a valving member, said carrier being movable from a position inside the container beneath said flow passage to a position outside said container.

4,426,889
MOLDED INERTIAL SENSOR

Roy A. Schluntz, Melrose, and John R. Stemniski, Swampscott, both of Mass., assignors to The Charles Stark Draper Laboratory, Inc., Cambridge, Mass.

Continuation of Ser. No. 932,139, Aug. 8, 1978, Pat. No. 4,281,555. This application Feb. 11, 1981, Ser. No. 233,319
The portion of the term of this patent subsequent to Aug. 4, 1998, has been disclaimed.
Int. Cl.³ G01C *19/02, 19/30, 19/06*
U.S. Cl. 74—5 R **9 Claims**

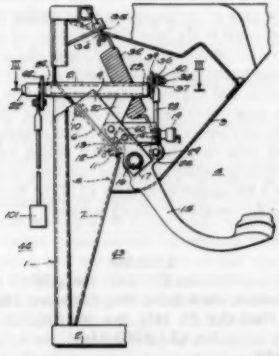


1. An inertial sensor comprising:
a gimbal assembly including a molded plastic body member having end sections at opposite ends thereof, and adapted for pivotal motion about an output axis, and
a molded plastic sleeve member adapted to fit over said gimbal member, including sections adapted to interfit with said end sections to seal the region interior to said sleeve member.

4,426,890
CLUTCH PEDAL OPERATING THROUGH A FORE AND AFT SHAFT IN A FIRE WALL OF A VEHICLE

Kenneth N. Hansen, Waukesha, Wis., assignor to Allis-Chalmers Corporation, Milwaukee, Wis.

Continuation of Ser. No. 73,254, Sep. 7, 1979, abandoned. This application Aug. 13, 1981, Ser. No. 292,650
Int. Cl.³ G05G *9/08*
U.S. Cl. 74—478 **5 Claims**

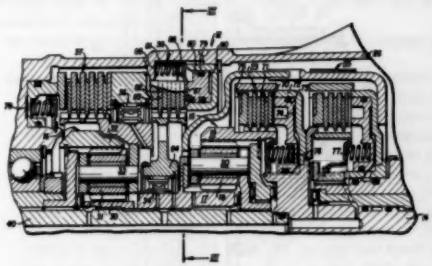


1. A foot pedal assembly for operation in a vehicle comprising, means defining an operator station including a wall forming an opening between an operator station and an engine compartment, a pedal support structure on said wall pivotally supporting said pedal, a return spring normally biasing said pedal to a return position, a pivotal shaft, a bearing supporting said shaft for extending through said wall and providing sound attenuation around said shaft, a cross bar connected to said shaft in said engine compartment forming a first arm for operating a clutch and a second arm for operating a brake, a cross member connected to said shaft in said operator station forming a first arm and a second arm, a link connected between said pedal and first arm of said cross member to pivotally rotate said shaft and selectively operate said clutch and brake, a brake engaging sensing device mounted in the operator station, a push rod connecting said second arm of said cross member for operating said push rod for selectively engaging said brake engagement sensing device and resisting the rotation of said shaft simultaneously with operation of said brake to thereby provide the operator a sense of "feel" when said brake is actuated.

4,426,891
RADIALLY OUTWARD RETURN SPRING FOR TRANSMISSION BRAKE

Seitoku Kubo, Toyota; Koujiro Kuramochi, Okazaki, and Tatsuo Kyushima, Toyota, all of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed Oct. 30, 1980, Ser. No. 202,122
Claims priority, application Japan, Mar. 21, 1980, 55-36644
Int. Cl.³ F16H *37/00*
U.S. Cl. 74—740 **2 Claims**

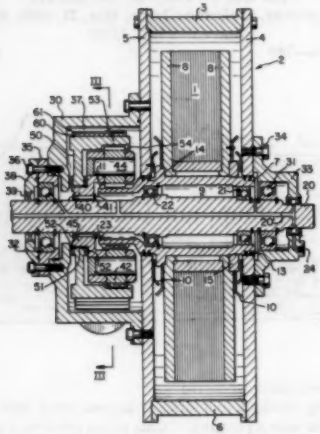


1. A transmission comprising:
a housing having a cylindrically arcuate inner wall portion formed with a plurality of axial spline grooves, a plurality of axial cylindrical holes arranged side by side with said axial spline grooves at substantially the same axial portion of said housing and each being closed at one end thereof, and a plurality of cutaway holes axially connected with the other ends of said axial cylindrical holes;
a gear transmission mechanism received within said housing;
a plurality of first annular friction plate elements mounted substantially parallel to and overlapping one another so as to be rotatable about an axis, and connected to part of said gear transmission mechanism, and a plurality of second annular friction plate elements mounted substantially parallel to and overlapping one another and interleaved and axially opposed to said first annular friction plate elements and having a plurality of first radially outwardly projecting tag portions engaged into said plurality of axial spline grooves so as to be rotationally coupled to said housing, selective mutual engagement and disengagement of said first and second annular friction plate elements selectively providing different speed stages of said transmission;
a fluid pressure chamber and a piston fitted in said fluid pressure chamber; supply of fluid pressure to said fluid pressure chamber impelling said piston so as to squeeze said first and second annular friction plate elements together in the direction along said axis and so as to cause said engagement;
an annular pressure member located between said piston and said first and second annular friction plate elements and transmitting force from said piston to engage said first and second annular friction plate elements together, said annular pressure member having a plurality of radially out-

wardly projecting tag portions each being engaged into one of said cutaway holes; and

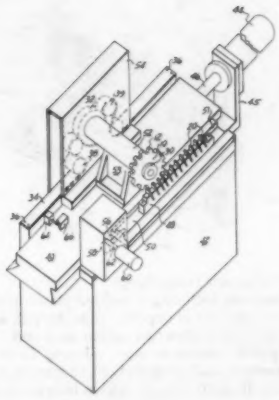
a plurality of compression coil springs each being mounted in one of said axial cylindrical holes with one end thereof abutting said closed end of said axial cylindrical holes and with the other end thereof abutting said tag portion of said annular pressure member, arranged radially external with respect to said axis from said first and second annular friction plate elements, said springs biasing said piston by way of said annular pressure element in the direction to reduce the size of said fluid pressure chamber.

4,426,892
COUPLING
William L. Frey, 303 Ivory Ave., Pittsburgh, Pa. 15214
Filed May 2, 1980, Ser. No. 146,062
Int. Cl.³ F16H *47/00, 57/10*
U.S. Cl. 74—785 **8 Claims**



1. In combination with a driven shaft and a rotary turbine having a housing forming a turbine chamber, an elongated hub rotatably mounted in said housing and extending axially through said turbine chamber, a plurality of radial wires mounted on said hub and located in said turbine chamber, a sun gear on the external surface of an end of said elongated hub and located outside of said housing, said driven shaft coaxial with said hub adapted to be connected to and rotated by a primary power means external to said rotary turbine and a coupling for selectively connecting said hub to said driven shaft to transmit additional rotary motion, said additional rotary motion being imparted from said hub to said driven shaft to supplement the primary power applied to said driven shaft, said coupling including a planetary gear carrier nonrotatably mounted on said driven shaft for rotation with said shaft, a plurality of angularly spaced planetary gears rotatably mounted on said planetary gear carrier and the radial distance between the axis of rotation of each of said planetary gears and the axis of rotation of said sun gear being the same, each of said planetary gears meshing with said sun gear on said hub, an internal ring gear meshing with each of said plurality of planetary gears and means mounting said ring gear for rotation about said driven shaft, brake means for said internal ring gear, means to actuate said brake means to lock said internal ring gear, whereby rotation of said sun gear drives said plurality of planetary gears and said planetary gears drive said internal ring gear when said brake means is nonactuated, and wherein no additional rotary motion is imparted to said driven shaft and said internal ring gear is stationary when said brake means is actuated and rotation of said planetary gears by said sun gear rotates said planetary gear carrier and said driven shaft to impart said additional rotary motion to said driven shaft.

4,426,893
HIGH PRODUCTION SERRATOR
Stewart F. Miller, Mt. Clemens, Mich., assignor to Lear Siegler, Inc., Santa Monica, Calif.
Filed Apr. 28, 1980, Ser. No. 144,457
Int. Cl.³ B21K *5/20*
U.S. Cl. 76—1 **10 Claims**



1. Apparatus for repeatedly and sequentially performing cuts from the crests to the roots of all of the teeth of a gear-like workpiece, comprising a base, a slide on said base, means acting between said base and slide for effecting rectilinear reciprocation of said slide in cutting and idle return strokes in a path having a length at least equal to the base circumference of a workpiece, a rotatable work support shaft on said slide having its axes perpendicular to the path of reciprocation of said slide, means acting between said base and said shaft effective to rotate said shaft in accordance with reciprocation of said slide, an elongated tool holder on said base extending parallel to the path of reciprocation of said slide and having a length at least equal to the base circumference of a workpiece, a multiplicity of cutting blades spaced along said tool holder at a spacing equal to the base pitch of teeth on a workpiece or a multiple thereof, said blades having cutting edges effective to cut from the crest to the root of the workpiece teeth during a cutting stroke, and means operable in timed relation to reciprocation of said slide to adjust said tool holder longitudinally between successive cutting strokes of said slide to position said blade to take a succession of cuts on all of the teeth of a work gear during a succession of cutting strokes.

4,426,894
AUTOMATIC SAW SWAGE
Gerald L. Nicolodi, 3150 Bailey Rd., Mulberry, Fla. 33860
Filed Oct. 30, 1981, Ser. No. 316,735
Int. Cl.³ B23D *63/06*
U.S. Cl. 76—54 **8 Claims**

1. A swage machine for swaging the teeth of a saw, comprising in combination:

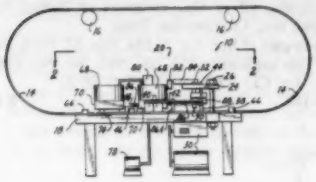
a platform for receiving the saw;

a swaging mechanism for swaging the tooth engaged therein;

an indexing means for indexing the saw along the length of the platform and for moving the tooth to be swaged into an engaging position with the swaging mechanism; and

said indexing means including a magnet means positioned for

engagement with the saw to permit said indexing means to index the saw forwardly and then to move the saw rearwardly enabling the tooth to be swaged to engage said swaging mechanism.

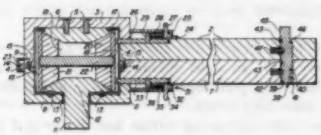


4,426,895

RATCHET WRENCH

Larry H. Lack, 901 Lincoln Dr., Shreveport, La. 71107

Filed Feb. 25, 1982, Ser. No. 352,182
Int. Cl.³ B25B *17/00*
U.S. Cl. 81—57.39 **10 Claims**



1. A ratchet wrench comprising:

(a) a top housing and a top handle carried by said top housing in fixed relationship;

(b) a bottom housing adjacent said top housing and a bottom handle carried by said bottom housing in fixed relationship;

(c) a ratchet drum having a hollow interior and located inside said top housing and said bottom housing, and splines provided on the external surface of said ratchet drum;

(d) a shaft horizontally secured inside said ratchet drum and a pair of drum bevel gears rotatably mounted on said shaft in oppositely-disposed relationship;

(e) a top bevel gear secured to the inside of said top housing and engaging said drum bevel gears;

(f) a drive bevel gear in rotatable cooperation with said bottom housing and engaging said drum bevel gears, and a socket drive carried by said drive bevel gear and extending through said bottom housing, whereby rotation of said top housing effects rotation of said drum bevel gears and said drive bevel gear to rotate said socket drive;

(g) first ratchet means carried by said top housing and said top handle, and second ratchet means carried by said bottom housing and said bottom handle, said first ratchet means and said second ratchet means selectively cooperating with said splines in said ratchet drum to facilitate rotation of said ratchet drum in a selected direction and rotation of said drum bevel gears to drive said drive bevel gear upon rotatable manipulation of said top handle and said bottom handle; and

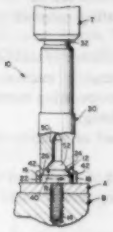
(h) lock means cooperating with said top handle and said bottom handle to selectively lock said top handle and said bottom handle together and release said top handle and said bottom handle for rotational manipulation of said top handle and said bottom handle both toward and away from each other.

4,426,896

TAMPER-PROOF FASTENER REMOVAL TOOL

David A. Kesselman, 16685 Arnold Dr., Sonoma, Calif. 95476

Filed Dec. 8, 1981, Ser. No. 328,684
Int. Cl.³ B25B *23/08*
U.S. Cl. 81—441 **5 Claims**



1. A removal tool for removing an in situ tamper-proof fastener of the type having a free turning shield surrounding a conical head of the fastener for preventing the grasping of that fastener head by a tool such as a wrench or the like, the removal tool comprising:

an elongate arcuate body having means thereon for engaging a torquing means; and

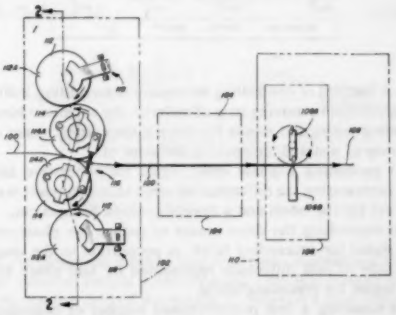
fastener head engaging means on said body, said fastener head engaging means including means for accomodating the fastener conical head and a plurality of spikes extending outwardly from said body, each of said spikes extending along a secant of said arcuate body being angled at an acute angle with respect to a longitudinal centerline of said elongate body and being at an acute angle with respect to a transverse centerline of said elongate body to form a snagging point which is located adjacent to the shield to snag the fastener head and couple that head to the body so that rotation imparted to said body by a power means is transferred to the fastener head.

4,426,897

THERMAL ADJUSTMENT METHOD AND APPARATUS FOR ROTATING MACHINES

Francis J. Littleton, 182 McNair Rd., East Amherst, N.Y. 14221

Filed Jul. 13, 1981, Ser. No. 282,596
Int. Cl.³ B26D *7/26*
U.S. Cl. 83—37 **7 Claims**



4. A method of operating apparatus for performing a desired operation on material passing therethrough, said apparatus comprising a frame having first and second support portions, an operating member mounted for rotation on said support portions, a cooperating member mounted on said support portions and disposed relative to said operating member so that

said desired operation is performed on said material as it passes between said operating and cooperating members and said operating member is rotated, said method comprising:

(a) setting the position of said operating and cooperating members relative to said frame;

(b) fixing the position of said operating and cooperating members relative to said frame;

(c) rotating said operating member to perform said operation; and

(d) adjusting the temperature of said first and second support portions to approximately maintain the setting between said operating and cooperating members of said apparatus, said step (d) comprising:

(e) monitoring the speed of rotation of said operating member;

(f) translating the speed of rotation of said operating member into a desired temperature for said first and second support portions;

(g) monitoring the temperature of said first and second support portions; and

(h) controlling thermal elements mounted on said first and second support portions to maintain the temperatures of said support portions at approximately said desired temperature determined in step (f).

4,426,898

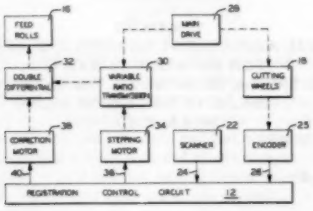
REGISTRATION CONTROL METHOD FOR A LABEL CUTOFF APPARATUS

Nelson Friberg, Toledo, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio

Division of Ser. No. 208,712, Nov. 20, 1980, Pat. No. 4,384,500. This application Jan. 10, 1983, Ser. No. 456,665

Int. Cl.³ B23Q *15/12*; B26D *5/20*

U.S. Cl. 83—37 **10 Claims**



1. A method of controlling an apparatus for cutting individual labels from a moving strip of material, the apparatus having a cutting means and means for driving the cutting means and the strip of material, comprising the steps of:

(a) generating a phase error signal for successive labels representing the difference between an actual position of a cut for the labels and a desired position for said cut;

(b) controlling the drive means to reduce the phase error signal for succeeding labels in proportion to the magnitude of said difference represented by said phase error signal for preceding labels;

(c) summing a first predetermined number of consecutive phase error signals to generate a sum signal having a magnitude proportional to the sum of the differences represented by said phase error signals; and

(d) controlling the drive means to change the speed of the strip of material relative to the speed of cutting of the cutting means in response to said sum signal magnitude exceeding a first predetermined value.

4,426,899

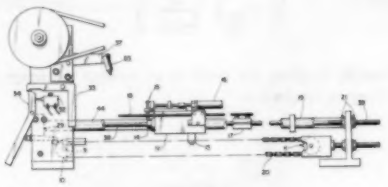
APPARATUS FOR PUNCHING HOLES IN TUBING

Kelso M. Long, and Leonard Pharr, both of Ringgold; Earl J. Pharr, Rossville, all of Ga., assignors to Burner Systems International, Inc., Chattanooga, Tenn.

Continuation-in-part of Ser. No. 76,046, Sep. 17, 1979, Pat. No. 4,269,098. This application Feb. 25, 1981, Ser. No. 238,239

Int. Cl.³ B26D *5/24*; B21D *28/22*

U.S. Cl. 83—188 **5 Claims**



1. Apparatus for punching holes in tubing, comprising:

A. A base;

B. A frame supported on said base and extending vertically at one end thereof;

C. A rotatably driven eccentric drive shaft with clutch mechanism, supported upon an horizontal axis at the top of said frame;

D. A press head reciprocally supported in said frame beneath said drive shaft, so as to operatively engage said eccentric drive shaft, said press head including an adjustable, downwardly extending punch;

E. A tube collar supported within said frame and vertically adjustably aligned with respect to said punch, so as to circumferentially engage and position tubing being punched;

F. At least one tube arbor supported upon said base and movably positioned upon said base away from said tube collar, so as to engage an end of tubing being punched within said tube collar, while moving longitudinally toward said tube collar, each said tube arbor further including:

i. a horizontal guide means concentrically aligning said tube arbor with respect to said tube collar;

ii. a longitudinally extending guide, limiting longitudinal advance of said tube arbor toward said press head; and

iii. a stop means supported upon said horizontal guide, so as to limit longitudinal movement of said tube arbor away from said tube collar; and

iv. a drive means linked at one end to said punch and linked in another portion to said tube arbor, so as to move said tube arbor longitudinally, synchronously towards said tube collar with reciprocation of said punch, by said eccentric drive shaft.

4,426,900

SAW CHAIN USING AN IMPROVED SIDE CUTTER TOOTH

Douglas J. Lemery, Victoria, Canada, assignor to Kolve Sawchain Company, Gresham, Oreg.

Filed Oct. 26, 1981, Ser. No. 314,745

Int. Cl.³ B27B *33/14*

U.S. Cl. 83—833 **14 Claims**

1. An improved side cutter tooth for a saw chain of a chain saw, comprising:

(a) a first link having

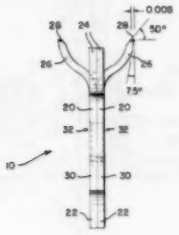
(i) a body defining a plane for the tooth and two half-spaces separated by the plane;

(ii) a root, extending from the body in the plane, capable of engaging a sprocket of the chain saw;

(iii) a leading depth gauge extending laterally outwardly from the body in a direction substantially opposite the root but in the plane; and

(iv) a trailing cutter element of flexible metal allowing the

element to flex outwardly under normal cutting loads so that the cutting width of the link is at least as great as the cutting width of raker teeth in the saw chain, the element extending laterally outwardly from the body in a direction substantially opposite the root, yet spaced behind the depth gauge, including a continuously curved portion attached to the body and ending in a cutter tip, the portion curling out of the plane into one half-space, wherein the continuous curve causes the cutter element to bend substantially at the intersection of the body and the cutter element when the cutter



element is exposed to inwardly directed forces which tend to flatten the curved portion from the half-space into the plane, thereby reducing crimping and breakage of the cutter element; and

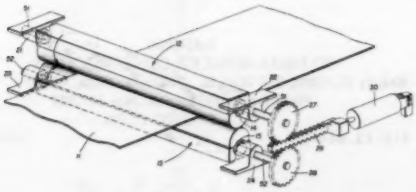
(b) a second link having a cutter element of flexible metal allowing the element to flex outwardly under normal cutting loads as with the first link, the second link being substantially a mirror image of the first link, positioned adjacent the first link in substantial alignment with the first link to form a side cutter tooth capable of simultaneously cutting slits on both sides of a kerf when moving as part of a saw chain.

4,426,901

CRUSH CUTTER

James E. Hogan, Canton, and George M. Camplair, Clinton, both of Ohio, assignors to The Firestone Tire & Rubber Company, Akron, Ohio

Filed Nov. 16, 1981, Ser. No. 321,983
Int. Cl.³ B26F *3/10, 3/04*
U.S. Cl. 83—861 **13 Claims**



13. A method for cutting a material using two substantially parallel eccentrically mounted heated rollers comprising the steps of:

a. placing said material between said rollers,

b. rotating said rollers to a position wherein said rollers are immediately adjacent to one another whereby said material is at least partially cut,

c. rotating said rollers to a position wherein said rollers are sufficiently far enough apart to remove said material from between said rollers, and

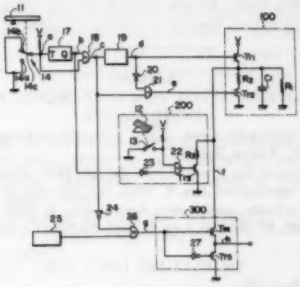
d. removing said deformable material from between said rollers.

4,426,902

TOUCH-RESPONSIVE CONTROL APPARATUS FOR ELECTRONIC MUSICAL INSTRUMENTS

Takatoshi Okumura, and Shigemitsu Yamaoka, both of Hamamatsu, Japan, assignors to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu, Japan

Continuation of Ser. No. 210,345, Nov. 25, 1980, abandoned.
This application Feb. 9, 1982, Ser. No. 347,185
Claims priority, application Japan, Nov. 30, 1979, 54-155786
Int. Cl.³ G10H *1/057, 1/46*
U.S. Cl. 84—1.1 **20 Claims**



20. A touch responsive control apparatus for a keyboard electronic musical instrument, comprising:

a switch mechanically movable from a first position to a second position upon depression of a key in said keyboard,

a capacitor,

charging means for rapidly charging said capacitor to a first level upon initial movement of said switch away from said first position upon depression of a key, and

discharging means for then discharging said capacitor at a fixed rate until said switch reaches said second position during said key depression,

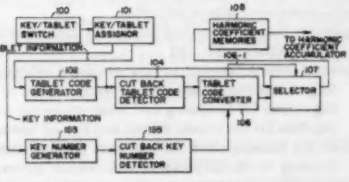
the resultant voltage on said capacitor being indicative of the speed of depression of said key.

4,426,903

ELECTRONIC MUSICAL INSTRUMENT

Kiyomi Takauji, Hamamatsu, Japan, assignor to Kabushiki Kaisha Kawai Gakki Seisakusho, Japan

Filed Apr. 26, 1982, Ser. No. 372,050
Claims priority, application Japan, May 27, 1981, 56-80462
Int. Cl.³ G10H *1/06*
U.S. Cl. 84—1.22 **1 Claim**



1. An electronic musical instrument which computes amplitude values of sample points by using a discrete Fourier transfer to obtain a desired waveshape to generate a tone, comprising:

key number generating means for giving key numbers to keys of a keyboard;

memory means for storing a set of harmonic coefficients for each tone to be generated;

means for generating a tablet signal for reading out from the memory means the set of harmonic coefficients of a tone to be generated;

cut back key number detecting means for detecting the key number of a sound region desired to be cut back;

cut back tone detecting means for detecting a tone desired to be cut back by a signal from the tablet signal generating means; and

means for converting the tablet signal into a different tablet signal by signals from the cut back key number detecting means and the cut back tone detecting means;

wherein a set of harmonic coefficients different from those to be read out from the memory means by the signal from the tablet signal generating means are read out from the memory means by the signal from the tablet signal converting means, thereby to cut back a musical sound.

4,426,904

ENVELOPE CONTROL FOR ELECTRONIC MUSICAL INSTRUMENT

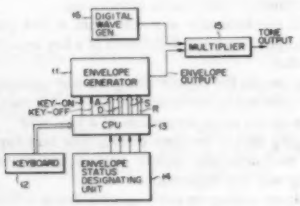
Masanori Ishibashi, Ome, Japan, assignor to Casio Computer Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 287,691, Jul. 28, 1981, abandoned. This application Jan. 5, 1983, Ser. No. 455,871

Claims priority, application Japan, Aug. 1, 1980, 55-105952; Aug. 6, 1980, 55-108676; Aug. 6, 1980, 55-108677; May 19, 1981, 56-74244

Int. Cl.³ G10H *1/057, 7/00*

U.S. Cl. 84—1.26 **14 Claims**



1. An envelope control device for an electronic keyboard musical instrument having performance keys comprising:

envelope information setting means for setting information representing the attack period, decay period, sustain level and release period of the envelope of a musical sound;

state memory means for setting and storing a current status of the envelope changing in the order of attack status, decay status, sustain status and release status from the time of depression of a performance key until the time of release of the performance key; and

digital processing means including

memory means for storing waveform data representing an exponential curve; and

control means coupled to said envelope information setting means and to said state memory means, and including means for accessing said memory means for obtaining data for the attack, decay, and release status sections of the envelope for the operated performance key according to the depression and release thereof on the basis of preset information from said envelope information setting means while controlling the memory state of said state memory means.

4,426,905

PIANOHARP ACTION

Ellis Barron, 7228 Eads Ave., La Jolla, Calif. 92037

Filed Sep. 23, 1982, Ser. No. 421,974

Int. Cl.³ G10D *3/16*

U.S. Cl. 84—258 **2 Claims**

1. In a keyboard type of musical instrument having a set of one or more vibratable elements for each key-lever or note thereof, an improvement in the plucking means for each set of said elements comprising;

(a) a tiltable pick-body carrying at one end a set of picks for plucking said set of vibratable elements, and being driven at the opposite end by said key-lever;

(b) a crank having two arms at right angles and having a pivot, said pivot being carried by said pick-body;

(c) a pin fixed in one arm of said crank and sliding in a guide

slot fixedly located in alignment with said vibratable elements;

(d) pneumatic piston means engaging the opposite arm of said crank and causing said pick-body to tilt into said vibratable elements during the pluck stroke; and

(e) spring means engaged between said pick-body and said opposite arm of said crank so as to cause said picks to escape said vibratable elements upon release of said key-lever.

4,426,906

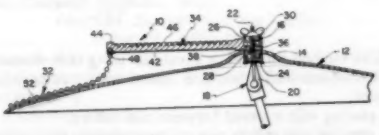
CYMBAL SIZZLER CONSTRUCTION

Robert W. Otto, 934 Burt St., Taunton, Mass. 02780

Filed Dec. 6, 1982, Ser. No. 447,169

Int. Cl.³ G10D *13/06*

U.S. Cl. 84—402 **15 Claims**



1. A sizzler construction in combination with a cymbal element comprising:

(a) a cymbal element;

(b) an elongated chain; and

(c) means for securing said chain so that at least a portion thereof overlies the upper surface of said cymbal element.

4,426,907
AUTOMATIC TUNING DEVICE

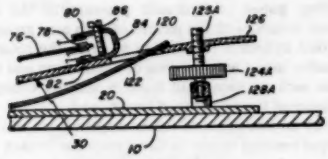
Donald T. Scholz, 13 Rich Valley Rd., Wayland, Mass. 01887

Continuation of Ser. No. 300,759, Sep. 10, 1981, Pat. No. 4,375,180, which is a continuation-in-part of Ser. No. 190,753, Sep. 25, 1980, abandoned, which is a continuation of Ser. No. 74,166, Sep. 10, 1979, abandoned, which is a continuation of Ser. No. 931,841, Aug. 7, 1978, abandoned. This application Sep. 30, 1982, Ser. No. 430,774

The portion of the term of this patent subsequent to Mar. 1, 2000, has been disclaimed.

Int. Cl.³ G01G *7/02*

U.S. Cl. 84—454 **2 Claims**



1. A method of adjusting the tuning of at least one string of a stringed musical instrument, comprising the steps of;

sensing a tension associated with the string,

determining when the sensed tension deviates from a preselected tension and providing a visual indication corresponding to two different tension levels corresponding to sharpness and flatness of the associated string, and manually adjusting the string tension in a direction to increase or decrease the tension and in accordance with the visually distinguishable tension levels for retuning the string.

4,426,908
ELASTIC TENSION MEMBER

Martin Ullmann, Reichgasse 59, CH-9030 Abtwil, Switzerland

Filed Mar. 10, 1982, Ser. No. 356,887

Claims priority, application Switzerland, Mar. 11, 1981, 1637/81

Int. Cl.³ D04C *1/12*

U.S. Cl. 87—6 **7 Claims**

1. An elastic tension member, wherein there is disposed within a hoselike jacket a core comprising a line non-stretchable throughout its length and at least one elastic member connected to the line at two spaced mounting joints, a segment of the line located between the joints being curly and longer than the elastic member so that any acting tension forces are transferred to the non-stretchable line as soon as a specific maximum load of the elastic member has been reached.

6. A method of making an elastic tension member comprising the steps of forming a core by connecting at least one elastic member at two spaced mounting joints to a line non-stretchable throughout its length so that a segment of said line located between said joints is curly and longer than said elastic member when said elastic member is in a non-tensioned state, any tension forces acting on said core being transferred to said non-stretchanble line as soon as a specific maximum load has been reached, on said elastic member; stretching said core to extend said elastic member and said non-stretchable line; and forming a jacekt about said stretched core so that said core is disposed within a hoselike jacket having an inner space for receiving said curly segment of non-stretchable line.

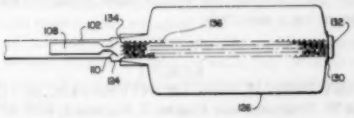
4,426,909
NOISE, FLASH AND SMOKE SUPPRESSOR APPARATUS AND METHOD FOR ROCKET LAUNCHER

Charles R. Carter, Huntsville, Ala., assignor to The Boeing Company, Seattle, Wash.

Filed Oct. 20, 1981, Ser. No. 313,227

Int. Cl.³ F41F *3/04, 17/12*

U.S. Cl. 89—1.816 **22 Claims**



22. A method of suppressing a shock wave generated by a rocket launching device, wherein the rocket launching device comprises an elongated launch tube, a forward end from which a rocket is fired, and a rear exhaust end through which exhaust gases exit during firing of the rocket, said exhaust end having an exhaust opening with a predetermined cross sectional area; said method comprising

providing an elongated, flexible, tubular member having an enclosed rear and containing a cylindrical metallic element, said tubular member being formed of a compressible permeable fabric and having an expanded diameter substantially greater than the diameter of said exhaust opening;

attaching said tubular member over the rear exhaust opening in an uninflated condition such that said cylindrical metallic element is aligned with the rear of said exhaust opening; and

suppressing a shock wave generated by firing the rocket in a launch tube by causing said shock wave to inflate said member thereby partially absorbing the shock wave in the fabric of said member and causing said shock wave to penetrate the fabric of said member.

4,426,910
MAN-PORTABLE FOLDABLE LAUNCHER ROCKET WEAPON SYSTEM

Spencer J. Speer, Ontario, Calif., assignor to General Dynamics, Pomona, Calif.

Filed Dec. 17, 1981, Ser. No. 331,493

Int. Cl.³ F41F *3/04*

U.S. Cl. 89—1.816 **8 Claims**

1. A man portable rocket weapon system, comprising:

rocket means for use in said weapon system,

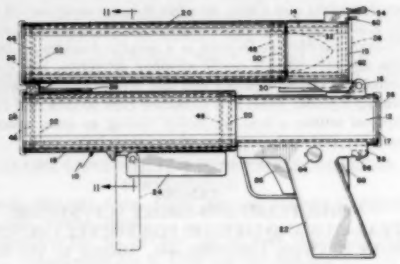
a first and second launch tube section connectable to each other at one end and foldable one upon the other for compact storage,

coupling means for unfolding and joining the launch tube sections in line with one another to form an extended rigid launching tube,

blast protection means mountable upon the launch tube sections,

grip means mountable upon the first launch tube section for holding the launching tube,

firing means mountable on the first launch tube section for firing the rocket means from the launching tube,



safety means in operative relationship with the firing means and the launching tube for firing the rocket means in an established sequence,

means for carrying the folded tube sections and rocket means on a waist belt.

4,426,911

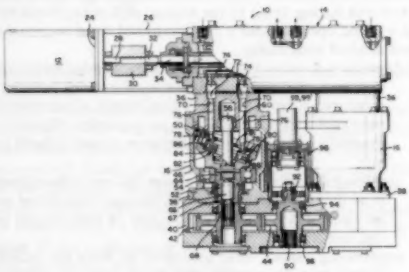
ROTARY DIGITAL ELECTROHYDRAULIC ACTUATOR

Curtiss W. Robinson, and Eugene T. Raymond, both of Seattle, Wash., assignors to The Boeing Company, Seattle, Wash.

Filed Feb. 1, 1980, Ser. No. 117,388

Int. Cl.[3] **F15B** *21/02;* **B64C** *9/00;* **F01B** *3/00*

U.S. Cl. 91—35 **15 Claims**



1. A rotary incremental electrohydraulic actuator, comprising:

an electric stepping motor operable by electrical command pulses and including a rotary output shaft which rotates an angular increment in response to each electrical command pulse received by said electrical stepping motor;

a pair of rotary output hydraulic motors, each having an output shaft;

a rotary output member;

torque summing gearing means connecting the output shafts of the hydraulic motors to said rotary output member;

each hydraulic motor comprising a plurality of cylinders, a fixed cylinder block in which the cylinders are in a ring surrounding a center line, pistons within said cylinders, said pistons and said cylinders extending parallel to the center line, and means for providing rotational torque to the output shaft of the motor, comprising a wobble plate connected to the output shaft, load bearing ends on the pistons which are in contact with the wobble plate, whereby axial movement of the pistons will apply a rotational torque to the wobble plate and to the output shaft connected thereto;

distributor valve means including a rotary control member connected to and rotated by the output shaft of the electric stepping motor, and port means controlled by rotation of said rotary control member for communicating hydraulic pressure and flow to a group of cylinders in series in each hydraulic motor means while venting the rest of the cylinders in each hydraulic motor means to a return line,

with rotation of said rotary control member sequencing pressurization for each hydraulic motor means by, in each hydraulic motor means, progressively adding a cylinder to the forward edge of the pressurized group of cylinders and removing a cylinder from the trailing edge of the pressurized group of cylinders, to in that manner deliver driving pulses of hydraulic pressure to the hydraulic motor means, with the pistons of each new group of pressurized cylinders functioning to drive the rotary output member into a new position or equilibrium and then hold it in such position until there is another change in the makeup of the pressurized group, and

whereby an increment of rotary displacement of the rotary output member occurs in direct response to each electrical command pulse that is received by the electrical stepping motor.

4,426,912

APPARATUS FOR THE CONTINUOUS ADJUSTMENT OF A JACK PISTON STROKE

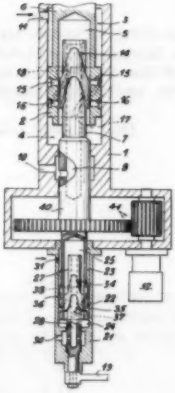
Roger Jarniac, Caluire, France, assignor to Commissariat A l'Energie Atomique, Paris, France

Filed Oct. 19, 1981, Ser. No. 312,695

Claims priority, application France, Oct. 23, 1980, 80 23066

Int. Cl.[3] **F15B** *21/02;* **F01L** *21/02*

U.S. Cl. 91—39 **3 Claims**



1. An apparatus for the continuous adjustment of the stroke amplitude of a piston of a jack, the latter having a control member of which at least part is in the form of a rod, which is movable in rotation and in translation and cooperates with the said piston, wherein said rod has an extension in the form of a differential piston which is movable in translation and in rotation within a cylinder and defining also in the latter a chamber with a large cross-section and a chamber with a small cross-section, the latter being permanently connected to a pressurized fluid source, said differential piston having an inner cavity in which is located a second rod immobilized in translation and which can be angularly oriented, said second rod being provided with a cam having two opposite edges which can cyclically uncover and cover, during the rotation of the differential

piston, at least two openings respectively connected to the two chambers.

4,426,913

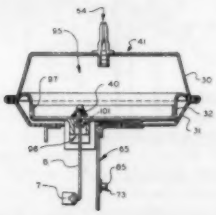
ROLLING DIAPHRAGM VACUUM MOTOR

John W. Orcutt, Norton, Mass., assignor to Texas Instruments Incorporated, Dallas, Tex.

Continuation of Ser. No. 58,887, Jul. 19, 1979, abandoned, which is a division of Ser. No. 58,888, Jul. 19, 1979, Pat. No. 4,291,717, which is a division of Ser. No. 830,530, Sep. 6, 1977, Pat. No. 4,206,645, which is a division of Ser. No. 501,711, Aug. 29, 1974, Pat. No. 4,063,682, which is a continuation of Ser. No. 422,954, Dec. 7, 1973, abandoned. This application Mar. 17, 1981, Ser. No. 244,549

Int. Cl.³ F15B 9/10

U.S. Cl. 91—376 R **2 Claims**



1. A rolling diaphragm vacuum motor having a case and an elongated output member projecting from the case, the output member having a given stroke, the case having an improved minimal case height for the given stroke comprising an upper case half configured generally as a frustum having a top wall which is essentially entirely flat and a side wall sloping outwardly going from the top wall in a downwardly direction, a vacuum port disposed in communication with the upper case half, a lower case half having a generally flat bottom wall provided with an aperture therethrough, a diaphragm entrapped between the upper and lower case halves so that the convolute thereof rolls onto the sloping side wall of the upper case half as vacuum in the motor is increased, a piston member having a flat portion generally the same size as that of the flat top wall of the upper case half, the piston member in contact with the diaphragm along essentially the entire flat portion of the piston member, the piston member attached to the diaphragm and movable therewith, the elongated output member attached to the piston and extending through the aperture in the bottom wall of the lower case half, a valve disposed in communication with the upper case half by providing an aperture extending through the diaphragm and the piston member, a valve seat disposed adjacent the aperture in the diaphragm and piston member, a valve member comprising an elongated rod having a disc shaped member fixedly attached to the rod to serve as a closure element movable into and out of engagement with the valve seat and adapted to close the valve when seated in the valve seat, the rod extending through the aperture in the bottom wall of the lower case half in generally the same direction as the elongated output member and connectable to control means.

4,426,914

AXIAL PISTON PUMP

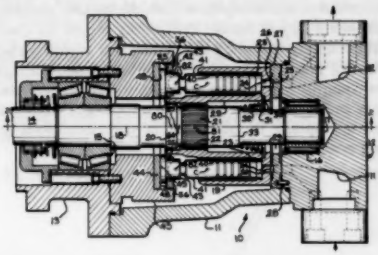
William L. Kline, Galena, Ohio, assignor to The Kline Manufacturing Company, Galena, Ohio

Filed Aug. 24, 1981, Ser. No. 295,826

Int. Cl.³ F01B 13/04

U.S. Cl. 91—487 **6 Claims**

1. A fluid pressure energy translating device including a housing having inlet and outlet passages, a stationary port plate mounted in said housing and having inlet and outlet ports communicating with said inlet and outlet passages in said housing, a rotatable cylinder barrel having a first end abutting said port plate, having an axis of rotation perpendicular to said port plate, defining a through bore having a set of straight female splines disposed therein and defining a plurality of cylinders circularly arranged about such axis of rotation, each cylinder having an axis spaced from and parallel to such axis of rotation, a piston in each cylinder, cam means for reciprocating said pistons as said barrel rotates, a drive shaft having a point of



maximum deflection, extending coaxially through said bore and rotatably supported in said housing, said drive shaft including a crowned annular surface supporting said barrel opposite said first end and concentric with such axis of rotation and a set of crowned male splines engaging said set of female splines in said barrel, said crowned surface and said set of crowned male splines having centers located on such axis of rotation on opposite sides of said point of maximum radial deflection of said drive shaft.

4,426,915

FLUID-OPERATED SERVOMOTOR FOR ACTUATION OF CLUTCHES OR THE LIKE

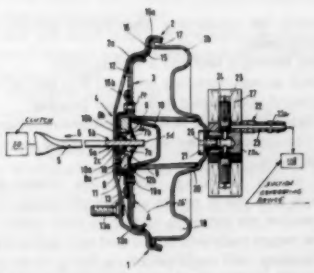
Paul Maucher, Sasbach; Oswald Friedmann, Lichtenau, and Johann Jäckel, Bühl, all of Fed. Rep. of Germany, assignors to Luk Lamellen und Kupplungsbau GmbH, Bühl, Fed. Rep. of Germany

Filed May 7, 1981, Ser. No. 261,292

Claims priority, application Fed. Rep. of Germany, May 23, 1980, 3019752

Int. Cl.³ F01B 9/00

U.S. Cl. 92—29 **17 Claims**



1. A servomotor, particularly for actuating the clutch of an automotive vehicle, comprising a fluid-operated prime mover including a component movable from a starting position in a first direction and back to the starting position in a second direction counter to said first direction; a motion transmitting member having a first surface; motion resisting means operable to yieldably oppose the movements of said member in said first and second directions; and a compensating device interposed between said component and said member, said device includ-

ing means for coupling said component with said member in response to movement of said component from and toward said starting position so that said member is normally free to move relative to said component only when the latter assumes said starting position, said coupling means including a coupling member having a second surface spaced apart from said first surface, a coupling element interposed between said surfaces and means for biasing said coupling element against said surfaces to thereby couple said members to each other in response to movement of said component from the starting position, said compensating device further comprising means for disengaging said coupling element from at least one of said surfaces in the starting position of said component and said disengaging means comprising a portion arranged to extend between said surfaces and to disengage said coupling element from said one surface in response to movement of said component to said starting position.

4,426,916

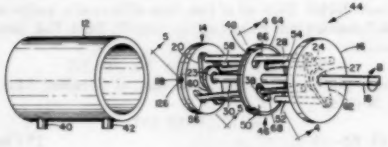
VARIABLE DISPLACEMENT MOTOR

Lewis L. Wimberley, Box 132, Barksdale, Tex. 78828

Filed Jun. 18, 1981, Ser. No. 274,785

Int. Cl.³ F01B *3/00*

U.S. Cl. 92—32 **11 Claims**



1. A motor for converting longitudinal motion to rotary motion comprising:

a housing having a first and a second end;

drive shaft means extending into said first end of said housing toward said second end of said housing;

piston means inside said housing, said piston means reciprocating longitudinally between said first and second ends of said housing;

ratchet means including ratchet pin means extending through said piston means and clutch means connecting said ratchet pin means to said drive shaft means;

angle pin means anchored in said first and said second end of said housing, said angle pin means being at an angle with respect to said ratchet pin means, either said ratchet pin means or said angle pin means being parallel to said drive shaft means; and

power means for causing longitudinally reciprocating motion of said piston means, said angle causing said piston means to have a first oscillatory rotary motion as said piston means reciprocates longitudinally,

said first oscillatory rotary motion of said piston means causing a second oscillatory rotary motion of said ratchet means which drives said drive shaft means via said clutch means in one rotary direction.

4,426,917

METHOD OF AND APPARATUS FOR CONDITIONING THE ATMOSPHERE OF A SPACE

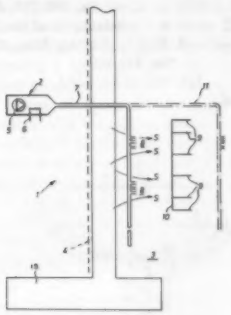
Robert Fulton, Maidenhead, England, assignor to Flakt Aktiebolag, Nacka, Sweden

Filed Apr. 7, 1981, Ser. No. 251,772

Claims priority, application United Kingdom, Apr. 11, 1980, 8012021

Int. Cl.³ F24F *13/04*

U.S. Cl. 98—38 B **8 Claims**



4. Apparatus for controlling the condition of the atmosphere of a space, comprising:

(a) a main supply means exterior of said space for introducing ventilating medium into said space;

(b) an independent source of conditioning medium;

(c) means to condition the medium connected with said independent source externally of said space; and

(d) a plurality of jets connected to said conditioning means by ducting, said jets being located in said space spaced from said main supply means and directed into said space whereby conditioned medium can issue from said jets into said space and induce a flow of said ventilating medium in the space to mix the ventilating medium and conditioning medium and condition the mixed medium as desired;

(e) ejector means spaced from said jets; and

(f) means to supply ventilating medium to said ejector means, said ejector means issuing said ventilating medium at high velocity and low volume relative to the medium supplied by said main supply means to control the direction of said mixed medium without adversely affecting its condition.

4,426,918

PROPORTIONING AIR DIFFUSER AND SYSTEM

Robert R. Lambert, 442 W. Leadora, Glendora, Calif. 91740

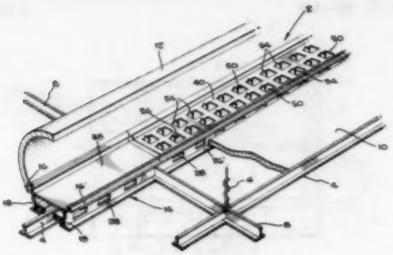
Continuation of Ser. No. 143,784, Apr. 25, 1980, abandoned. This application Nov. 23, 1981, Ser. No. 323,788

Int. Cl.³ F24F *13/10*

U.S. Cl. 98—40 D **1 Claim**

1. An air diffuser assembly for venting air from a dynamic plenum to an area to be vented, having: a pair of upper and lower blocking plates having substantially similar patterns of vent openings each of said plates comprising a grid of alternating webs and vent openings of approximately equal size with the vent openings defined between the webs, a plurality of upstanding air extractor vane means carried adjacent the vent openings on the plenum side of the lower plate of said plates and extending upwardly through vent openings of the upper plate of said plates, means for mounting said plates in overlapping alignment with said upper plate adjacent the plenum and said lower plate adjacent the vented area, said upper plate being slidable over the lower plate to vary the alignment between the vent openings of each plate, the aligned portions of the vent openings of the two plates defining the effective vent

between the plenum and the vented area, means for sliding the upper plate over the lower plate to vary the size of said effective vent, the webs of the upper plate progressively masking the vent openings of said lower plate as the upper plate is moved to a position of minimum effective venting; the improvement comprising:



the dimension of the venting openings for the lower plate in the direction of slide of said upper plate over said lower plate being slightly greater than the dimension of the webs of the upper plate of said plates in the same direction, whereby said air diffuser assembly function as a diffuser through the effective vent cannot be defeated, and

means for limiting the sliding movement of said upper plate relative said lower plate.

4,426,919

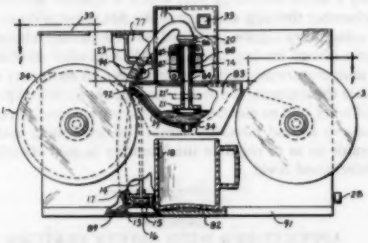
AUTOMATIC BREWING APPARATUS

Kenneth D. Rhoten, Evansville, Ind., assignor to Robert S. Smith, Hartford, Conn.

Filed Jul. 6, 1981, Ser. No. 280,789

Int. Cl.³ A47J *31/34*

U.S. Cl. 99—289 T **8 Claims**



1. A brewing apparatus comprising a reservoir containing water, means for heating and controlling the temperature of said water, storage means comprising a plurality of packets containing brewable substance affixed to a tape allowing liquid flow through said packets, said storage means allowing individual retrieval of said packets, a brewing basket receiving said storage means having an outlet for brewed liquid, movable head means comprising a head communicable with and providing water outlet to packets of said storage means being movable to allow intermittent tape passage, activation means for said movable head, pump means for conducting said water from said reservoir via conduit means to said movable head means, means for receiving and storing used packets and tape of said storage means, drive means for moving said storage means through said brewing basket, control means comprising operator activation means, latching means initiated by said operator activation means, said latching means interconnected with and controlling said drive means, sensor means for sensing position of packets of said storage means relative to said brewing basket, said sensor means defeating said latching means thereby, timing means interconnected with and responding to said sensor means, said timing means interconnected with and controlling said activation means for said movable head and said pump means, and timing control means interconnected with said timing means for providing timing control thereto.

4,426,920

COFFEE AND TEA MAKING OR BREWING APPARATUS

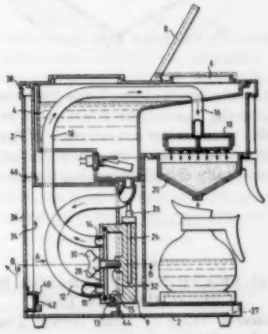
M. K. Phillips, St. Leonards-on-Sea (now by change of name from Maciej Karol Filipowicz), and Cecil Hayes, Hastings, both of England, assignors to W. M. Still & Sons Limited, Sussex, England

Filed Sep. 24, 1982, Ser. No. 423,024

Claims priority, application United Kingdom, Oct. 5, 1981, 8130052

Int. Cl.³ A47J *31/10*

U.S. Cl. 99—307 **3 Claims**



1. Apparatus for brewing or making coffee or tea comprising an exterior casing,

an internal cold water tank mounted within and at the top of the casing,

an inlet in the top of said casing communicating with said tank to replenish said tank with water,

an infuser basket mounted to and forwardly of said casing above a dispensing position,

an electrical heater with a heater element therein mounted in said casing below said tank,

said heater provided with a rearwardly opening cover and electrical element leads extending from a forward portion of the heater body,

a cold water-inlet connected to said tank,

a hot water outlet connected to a spray head above said basket,

a shield interposed between said cover and said leads and other electrical components of said apparatus, and

a rearwardly opening rear plate to said casing which when open enables easy access to said heater cover.

4,426,921

APPARATUS FOR REMOVAL OF BRAN FROM RICE AND LIKE CEREAL GRAINS

Elmond F. Meinardus, Houston, Tex., assignor to Riviana Foods, Inc., Houston, Tex.

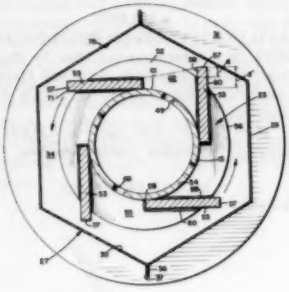
Filed Jan. 23, 1981, Ser. No. 227,744

Int. Cl.³ B02B *3/00, 3/04, 3/08*

U.S. Cl. 99—519 **18 Claims**

1. Apparatus for removing bran from rice and like cereal grains comprising an annular wall defining an open-ended grain processing chamber, a power driven rotor assembly within said chamber surrounded by said wall, means for introducing grains to be debranned between the wall and rotor

assembly at one end of said chamber and applying controlled pressure to move said grains through said chamber longitudinally of said rotor assembly to a discharge opening at the other end, and means for rotating said rotor assembly for effecting bran-removing abrasion of grain in said chamber; characterized by said rotor assembly being formed with inwardly closed pockets facing the operational direction of rotation of said rotor assembly to retain and convey some of the grains around with it during rotation, with the grains carried by said rotor assembly continually directly engaging the surrounding body of grain.



4,426,922

VERTICAL FRICTIONALLY ABRASIVE ROLL RICE POLISHING MACHINE

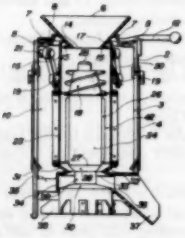
Soichi Yamamoto, 813 - 17 Oaza Tendou Kou, Tendou-Shi, Yamagata-Ken, Japan

Filed May 10, 1982, Ser. No. 376,281

Claims priority, application Japan, Jun. 9, 1981, 56-96371; Jun. 10, 1981, 56-89145; Jun. 17, 1981, 56-93635; Jun. 22, 1981, 56-96370

Int. Cl.[3] **B02B** *3/00, 7/02*

U.S. Cl. 99—519 **12 Claims**



1. A vertical frictionally abrasive roll rice polishing machine comprising a framework assembly including upper and lower frameworks, a vertical rotary shaft having an upper end extending within said upper framework in the axial direction of said framework assembly, a vertical abrasive roll mounted adjacent the upper end of said shaft for rotation therewith, a vertical polishing cylinder surrounding said abrasive roll in peripherally spaced relationship to the roll to define an annular polishing chamber therebetween, means for forcibly feeding unhulled rice into the upper end of said polishing chamber for travel downwardly in the axial direction of the chamber to a discharge passage provided at the lower end of said polishing chamber, and means mounting said polishing cylinder for limited vertical movement relative to said abrasive roll.

4,426,923

STORAGE DEVICE FOR PROCESSED FOODS

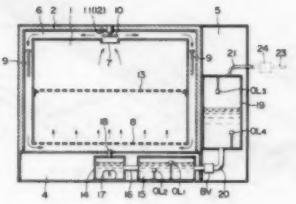
Takashi Ohata, No. 21-10, Tokiwadai 3-Chome, Itabashi-Ku, Tokyo, Japan

Filed Sep. 27, 1982, Ser. No. 424,152

Claims priority, application Japan, Jun. 18, 1982, 57-90913[U]

Int. Cl.[3] **A23L** *1/00;* **A21C** *13/00;* **H05B** *1/00*

U.S. Cl. 99—468 **6 Claims**



1. A storage device for processed foods, comprising a sealed storage chamber formed in such a manner that processed foods can be inserted thereinto and withdrawn therefrom, said chamber having upper, lower and oppositely disposed side walls defined by an inner surface thereof, an air passage provided in said storage chamber so as to extend along intermediate portions of said upper, lower and two oppositely disposed side walls of said inner surface thereof and having a suction port and discharge port means at an upper section and a lower section thereof, respectively, to permit the air to be circulated in said storage chamber, said discharge port means being formed adjacent a ventilating net located above said lower wall of said chamber, a fan provided in said upper section of said air passage in which said suction port is located for directing air downwardly through two side sections of said air passage for discharge through said discharge port means, an air heater provided in said storage chamber, a steam generator having a steam discharge port which is opened into said storage chamber through said ventilating net, a temperature sensor and a humidity sensor provided in said storage chamber, an electric circuit having a temperature regulator responsive to said temperature sensor for controlling said air heater so as to regulate the temperature in said storage chamber to a predetermined level, and an electric circuit having a humidity regulator responsive to said humidity sensor for controlling said steam generator so as to regulate the humidity in said chamber to a predetermined level.

4,426,924

APPLE CORER WITH SAFETY FEATURE

Charles W. Culwell, 6319 Hillcrest, Dallas, Tex. 75205

Filed Nov. 2, 1982, Ser. No. 438,621

Int. Cl.[3] **A23N** *4/12, 4/14;* **A47J** *25/00*

U.S. Cl. 99—545 **8 Claims**

1. An apple coring apparatus, comprising:

a base plate,

a first arm pivotally mounted at a first end thereof to said base plate,

a lever arm mounted at a first end thereof to the second end of said first arm and including a pin rigidly mounted to said lever arm and extending laterally therefrom,

a guide rod mounted normal to said base plate,

a tubular knife pivotally mounted to said lever arm,

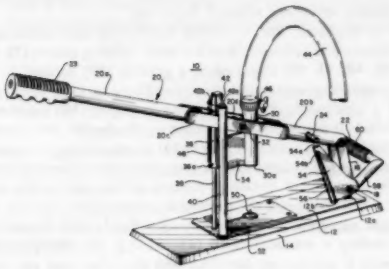
a blade rigidly connected to said tubular knife,

a sliding tube mounted for axial movement on said guide rod, said sliding tube rigidly connected to said blade,

blocking means for tensioning said lever arm away from said base plate, and

means supported by said base plate and having a first position for blocking the travel of said lever arm toward said base plate and having a second position permitting said

lever arm to travel toward said base plate to allow travel of said tubular knife toward said base plate, said blocking means comprising a second arm pivotally mounted at a first end to said base plate and having a notch at the second end thereof for receiving said pin, a handle rigidly connected to said second arm, and



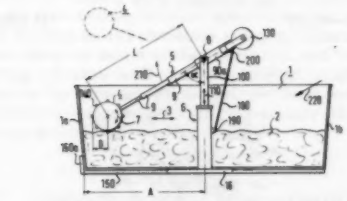
means for tensioning said second arm into said first position for engagement of said pin into said notch when said lever arm is moved towards said base plate wherein the application of force to said handle moves said second arm to said second position.

4,426,925

APPARATUS FOR COMPACTING TRASH IN OPEN CONTAINERS

Heinz Bergmann, Im Ründerdiek 1, D4474 Lathen, Fed. Rep. of Germany

Filed Jun. 18, 1981, Ser. No. 274,782
Claims priority, application Fed. Rep. of Germany, Jun. 24, 1980, 3023508; Feb. 27, 1981, 3107383
Int. Cl.³ B30B *3/02*; B65G *3/04*
U.S. Cl. 100—65 **34 Claims**



1. Apparatus having a base for compacting trash, in particular cardboard cartons or the like, in an upwardly open container positioned on said base, said container having an upper edge, comprising:

(a) a post (6) mounted on said base;

(b) a pivot arm (5) having a free end mounted in articulating manner to said post above said upper edge;

(c) a compacting roll (4) having a roughened surface rotatably supported from said free end;

(d) means for moving said compacting roll to-and-fro on said trash in said container; and

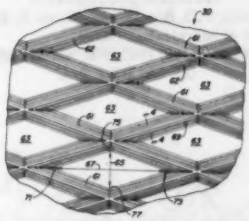
(e) said pivot arm having a telescoped length (L) and means for adjusting said length.

4,426,926

BELT FOR ROUND BALER

Gust S. Soteropulos, and Henry D. Anstey, both of Ottumwa, Iowa, assignors to Deere & Company, Moline, Ill.

Filed Sep. 15, 1981, Ser. No. 302,001
Int. Cl.³ A01D *39/00*; B30B *5/06*
U.S. Cl. 100—88 **18 Claims**



1. In a round baler comprising a plurality of transverse rolls; a plurality of side-by-side, elastomeric, elongated belts supported in driving engagement thereon, said rolls and belts defining an expandable, bale forming chamber opening downwardly and forming a crop inlet between a spaced pair of said plurality of rolls; the improvement comprising:

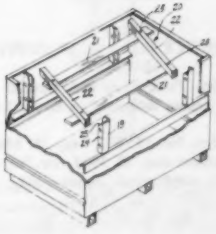
a plurality of integral, continuous walls formed in one surface of said belts defining therebetween a plurality of entirely enclosed recesses, the height of said walls being less than the maximum longitudinal distance between adjacent walls.

4,426,927

COMPRESSED WASTE HOLDDOWN

Lyndon M. Teague, Wilmington, N.C., assignor to Container Products Corporation, Wilmington, N.C.

Filed Jun. 1, 1982, Ser. No. 383,531
Int. Cl.³ B30B *15/06*
U.S. Cl. 100—219 **4 Claims**



1. A compressed waste holddown including an open top disposable waste container in which waste is placed and compressed by a waste compactor comprising;

(a) a removable waste holddown means including a normally square shaped frame having a pair of parallelly extending waste retaining plates and a pair of cross bars connected thereto,

(b) means for pivotally connecting said cross bars to said plates whereby said frame may be collapsed out of its normal square shape for free insertion through the open top of the container,

(c) guide means provided by the container for guiding said waste holddown means whereby it may be moved vertically through the interior of the container by the waste compactor during the compacting of the disposable waste placed therein,

(d) means provided by said holddown means cooperating

with said guide means for guiding its movement through the container, and

(e) means for retaining said waste holddown means in a depressed position upon the disposable waste compressed in the container by the waste compactor.

4,426,928

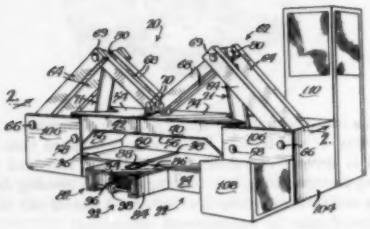
VEHICLE COMPACTOR

Richard E. Woods, P.O. Box 18, and Marvin D. Bradburn, P.O. Box 11, both of Markle, Ind. 46770

Filed Feb. 10, 1982, Ser. No. 347,489

Int. Cl.³ B30B *9/32*

U.S. Cl. 100—233 **16 Claims**



1. A device for compacting a vehicle, comprising:

a frame;

a pair of opposing doors, each pivotally mounted above said frame by a door pin, said doors pivotally movable about said door pins to converge toward the frame for compaction of the vehicle therebetween and to divergingly open away from the frame;

a pair of linkages spaced from the door pins, each linkage being interconnected between each door and the frame to manipulate the door for opening and closing thereof; and

drive means interconnected between each linkage and the door pin for the corresponding door to drive the linkage to open and close the door.

4,426,929

NUMBERING DEVICE FOR USE IN OFFSET PRINTING MACHINE

Nobuhiko Fujisawa, Fukuyama, and Yoshiki Matsui, Hiroshima, both of Japan, assignors to Ryobi Ltd., Hiroshima, Japan

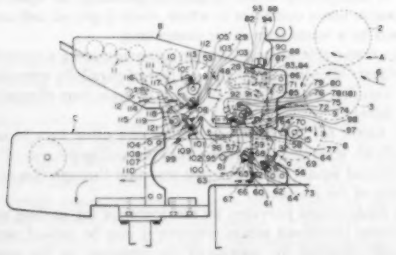
Continuation of Ser. No. 151,852, May 21, 1980, abandoned.

This application Jun. 28, 1982, Ser. No. 392,913

Claims priority, application Japan, May 31, 1979, 54-74533[U]; Jul. 30, 1979, 54-105659[U]

Int. Cl.³ B41F *13/56*

U.S. Cl. 101—76 **18 Claims**



1. An offset printing machine including a plate cylinder, a blanket cylinder, an impression cylinder confronting the blanket cylinder to perform ordinary printing operation, an ink supplying portion adapted to supply ink into a plate formed over the plate cylinder, and a sheet-delivery means comprising:

(a) a transfer drum (**8**) positioned beside the impression cylinder (**3**), said transfer drum having a sheet holding means (**13**) in order to hold leading edge of a printed sheet (**6**),

(b) a numbering-impression cylinder (**9**) swingably positioned beside the transfer drum (**8**),

(c) an eccentric shaft rotatably supporting said numbering-impression cylinder (**9**) and a sheet holding means (**38**, **38'**, **20**, **40**, **43**, **45**) disposed in a groove (**19**) formed in the numbering impression cylinder (**9**),

(d) a numbering box supporting cylinder (**10**) positioned beside the numbering impression cylinder (**9**), the numbering box supporting cylinder (**10**) accomodating a numbering box (**48**) adapted to form numbers on the printed sheet (**6**) transferred between the numbering box supporting cylinder (**10**) and the numbering-impression cylinder (**9**), said numbering-box supporting cylinder (**10**) further including a rotatable shaft (**49**) having one end provided with a numbering cam (**53**) and the other end provided with a detection plate (**55**), the shaft (**49**) being provided with a slidable ring (**50**) to which at least one numbering box (**48**) is secured,

(e) numbering box advancing means,

(f) an ink supply means (**11**) in contact with the numbering box supporting cylinder (**10**),

(g) a perforation means (**82**) positioned in confrontation with the numbering impression cylinder (**9**) to provide vertical perforations in the printed sheet (**6**), and

(h) synchronous means operatively connected between said transfer drum (**8**), said numbering-impression cylinder (**9**) and said numbering box supporting cylinder (**10**) for controlling the sequential advance of said numbering box; said transfer drum (**8**) being adapted to transfer the printed sheet (**6**) from the impression cylinder (**3**) to the numbering-impression cylinder (**9**) so as to confront the printed surface of the sheet (**6**) with the peripheral surface of the numbering box supporting cylinder (**10**).

4,426,930

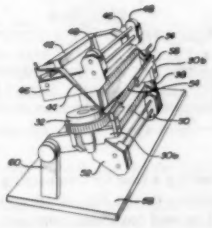
COMPACT BAND PRINTER

Val K. Jezbera, Thousands Oaks, Calif., assignor to Dataproducts Corporation, Woodland Hills, Calif.

Filed Dec. 7, 1981, Ser. No. 327,758

Int. Cl.³ B41J *1/20*

U.S. Cl. 101—93.14 **16 Claims**



1. A moving band printer assembly, comprising:

a base member;

an elongated hammer bank frame section secured to the base member;

a plurality of print hammers secured to the frame section along the length thereof, said print hammers for impacting along a common print line;

a character band including a portion extending along the print line adjacent to the hammers, wherein the character

band moves along the print line to position characters adjacent each print hammer;

an inked ribbon extending along the print line between the hammers and the character band; and

a platen located adjacent the character band on the side of the band opposite the print hammers, wherein each end of said platen is securely attached to the frame section to form a box shaped structure with the frame section and thereby increase the structural rigidity of the assembly.

4,426,931
DEVICE FOR KEEPING THE LOWER COVERING LAYER OF A TWO-LAYER COVERING ON A PRINTING-PRESS CYLINDER

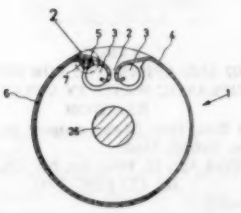
Wilfried Vogt, Walldorf, Fed. Rep. of Germany, assignor to Heidelberger Druckmaschinen Aktiengesellschaft, Heidelberg, Fed. Rep. of Germany

Filed Jul. 15, 1982, Ser. No. 398,552

Claims priority, application Fed. Rep. of Germany, Jul. 16, 1981, 3128105

Int. Cl.³ B41F *27/06*

U.S. Cl. 101—415.1 **8 Claims**



1. Device for keeping a lower covering layer of a two-layer covering on the cylindrical surface of a printing-press cylinder, the two-layer covering also including an upper covering layer covering the keeping device for the lower covering layer, the keeping device for the lower covering layer comprising a keeper rod having a substantially circular cross section and extending along the length of the printing-press cylinder, said keeper rod being braced at one end and at two axially parallel contact locations against the printing-press cylinder so as to position the keeping device in register and in inherently stable condition in circumferential and lateral directions, and locking pins disposed on and distributed in register-maintaining positions along the length of the keeper rod, said locking pins having respective head ends with different length-to-width ratios in the cross section thereof, said head ends being in cooperative engagement in correspondingly shaped holes formed in the lower covering layer.

4,426,932
CONTACT FUZE FOR MINE MUNITIONS

Frank H. Bell, Logan, Utah, assignor to Thiokol Corporation, Chicago, Ill.

Filed Nov. 5, 1981, Ser. No. 318,663

Int. Cl.³ F42C *15/38*

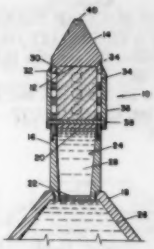
U.S. Cl. 102—221 **11 Claims**

1. An explosive device comprising a housing having an upper end and a lower end and having a cavity formed therein, said housing including adjacent its upper end a plurality of ventillation ports for the cavity,

a movable sleeve normally covering and sealing said ventillation ports, and

a desensitized liquid explosive filling said cavity to a level just below said ventillation ports, the desensitizing constituent of said desensitizing liquid explosive being a volatile solvent absorbed therein,

whereby upon movement of said sleeve and uncovering of said ventillation ports said volatile solvent is allowed to



evaporate and thus render said solvent desensitized liquid explosive sensitive, thereby arming said explosive device.

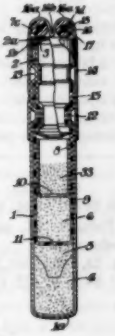
4,426,933
NON-ELECTRIC BLASTING ASSEMBLY

Malak E. Yunan, Boonton Township, Morris County, N.J., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 257,973, Apr. 27, 1981. This application Dec. 28, 1981, Ser. No. 334,890

Int. Cl.³ F42B *3/10*

U.S. Cl. 102—275.3 **21 Claims**



13. In a non-electric blasting assembly comprising:

(a) a percussion-actuated detonator comprising a tubular metal detonator shell integrally closed at one end and closed at the other end by a partially empty, shorter tubular metal primer shell having an open end and supporting a percussion-sensitive primer charge adjacent the inside surface of an integrally closed end, said primer shell extending open end first into said detonator shell to dispose the outside surface of its primer charge end across the end of said detonator shell, said detonator shell containing, in sequence from its integrally closed end, (1) a base charge of a detonating explosive composition and (2) a priming charge of a heat-sensitive detonating explosive composition;

(b) a substantially U-shaped segment of a length of receiver detonating cord held with its apex adjacent the integrally closed end of said detonator shell; and

(c) low-energy detonating cord (LEDC) adjacent the outside end surface of said primer shell; the improvement comprising a length of LEDC arrayed in a manner such that a pair of axially separated segments thereof are anchored in place, or two lengths of LEDC arrayed in a manner such that a segment from each length is anchored in place, in side-by-

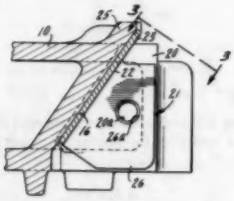
side relationship adjacent the outside end surface of said primer shell.

4,426,934

FRICTION CASTING BOLSTER POCKET WEAR PLATE HAVING A PLURALITY OF SIDES

Robert P. Geyer, Palatine, Ill., assignor to Standard Car Truck Company, Chicago, Ill.

Filed Jan. 20, 1982, Ser. No. 340,897
Int. Cl.³ B61F 5/12
U.S. Cl. 105—197 DB **3 Claims**



1. A wear plate for the friction wedge pocket of a railroad car truck bolster, the pocket having a slanted rear wall and adjoining side walls perpendicular thereto, the side walls being generally perpendicular to the longitudinal axis of the bolster, with one of the side walls being the inboard side wall and the other being the outboard side wall,

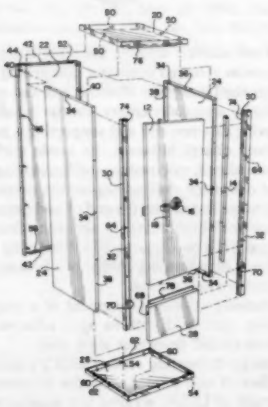
said wear plate including a main portion formed and adapted to substantially conform to the pocket slanted wall and a pair of wall portions, each integral with and perpendicular to said wear plate main portion, one of said wall portions being formed and adapted to substantially conform to the pocket outboard side wall and the other wall portion being formed and adapted to substantially conform to the pocket inboard side wall, and means on said wear plate for cooperative attachment to the pocket.

4,426,935

CASE FOR SECURING VALUABLES

Joseph Nikoden, Jr., Palatine, Ill., assignor to Detroit-Armor Corporation, Schaumburg, Ill.

Filed Jun. 23, 1982, Ser. No. 391,306
Int. Cl.³ A47B 47/02; E04H 9/00
U.S. Cl. 109—79 **10 Claims**



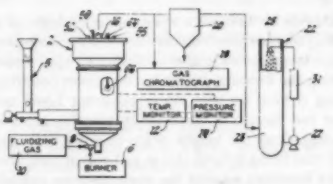
1. A case for securing valuables comprising a plurality of interconnected panels defining an interior space for placement of the valuables, a door providing access to said space, and a lock for said door, at least some of said panels supporting connectors on inside facing surfaces thereof, and cooperating connectors associated with the remaining panels, all of said connectors on said inside facing surfaces comprising a plurality of spaced-apart, inwardly extending studs attached to said inside facing surfaces and having no portions thereof on outside facing surfaces of said panels, said cooperating connectors comprising openings defined by the remaining panels dimensioned to receive said studs, said case being thereby free of any connectors for holding the panels together which are exposed on the exterior of the case, whereby, upon assembly of the respective panels, access to the connectors is available only from within said interior space.

4,426,936

METHOD AND APPARATUS FOR DISPOSAL OF THERMOPLASTIC WASTE IN A FLUIDIZED BED REACTOR

Hong-Hsiang Kuo, Troy, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Apr. 21, 1982, Ser. No. 370,458
Int. Cl.³ F23G 7/00
U.S. Cl. 110—245 **7 Claims**



6. A reactor for burning polymeric waste particles on a continuous, self-sustaining basis by injecting them into a bed of fluidized refractory particles at a bed temperature above their degradation reaction temperature, the reactor comprising a reaction chamber having a substantially right circular cylindrical shape and diffuser means for directing gas into said chamber under pressure to fluidize the refractory and waste particles, the diffuser means comprising an air impervious plate located at the bottom of the chamber in sealing relationship with the chamber walls, said plate having a plurality of small holes for admitting said gas into said chamber, wherein said holes are arranged such that there is a high density of holes in the plate center and a diminishing hole density in a radially outward direction from the plate center such that flowing gas through said holes upwardly through said chamber creates a relatively high pressure zone in the center of the reaction chamber and a relatively low pressure zone adjacent the chamber walls, the pressure differential causing the particles suspended in the fluidized bed to continuously travel in a toroidal path upwardly from the center of the reaction chamber and then down the reaction chamber walls and a metallic foam disc located above said plate to mediate the flow of pressurized gas from the plate therethrough and into the chamber thereby preventing any fugitive melted polymeric waste from clogging the said small holes in the plate.

4,426,937

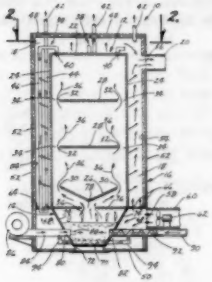
HEAT EXCHANGER FURNACE

Vernon H. Sietmann, Laurel, Iowa 50141; Steven C. Stockdale, and Elmer G. Stockdale, both of Rte. #3, Iowa Falls, Iowa 50126

Division of Ser. No. 176,409, Aug. 8, 1980, Pat. No. 4,319,557. This application Oct. 13, 1981, Ser. No. 310,478

Int. Cl.³ F23K *3/10*; F24H *3/00*

U.S. Cl. 110—288 1 Claim



1. A heat exchanger furnace, comprising,

a firebox including a bottom wall and an upwardly and outwardly flaring sidewall enclosure, an air inlet passage in communication at one end with said firebox, means for supplying air under pressure to said firebox through said air inlet passage, a fuel inlet opening in communication at one end with said firebox, means for supplying fuel to said firebox through said fuel inlet opening thereby to adjust the level of fuel in said firebox and a top wall adjacent said upper edge of said sidewall, said top wall having an outlet opening in communication with said heat exchanger housing for exhausting combustion gases thereto, and said sidewall enclosure having a frusto conical shape with a lower edge and an upper edge of larger diameter than said lower edge;

a heat exchanger housing in communication with said firebox for receiving combustion gases therefrom and being at least partially defined by at least one upright sidewall, and including a plurality of baffles therein, and means for supporting said baffles in vertically spaced-apart and generally horizontally extended relation therein, said baffles being continuous across said heat exchanger housing and terminating in peripheral edges disposed in clearance relation from said sidewall thereby to define a peripheral clearance opening therebetween;

a plenum housing surrounding said heat exchanger housing and spaced therefrom to define a plenum chamber therebetween;

means for separately controlling the rate of fuel and air supply to said firebox;

a fuel inlet passage in communication with said fuel inlet opening for conveying fuel thereto;

and a transfer tube in communication at one end with said air inlet passage and in communication at the other end with said fuel inlet passage whereby air introduced into said fuel inlet passage from said air inlet passage is operative to prevent the escape of combusion gases from said firebox through said fuel inlet passage, said air inlet passage having a reduced diameter portion adjacent said firebox and said transfer tube communicating with said air inlet passage upstream of said reduced diameter portion.

4,426,938

METHOD OF PREPARING IGNITION FUEL PURSUANT TO FLOW DYNAMICS FROM A PRIMARY FUEL FLOW FOR A PULVERIZED FUEL PILOT LIGHT

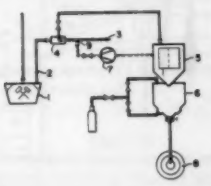
Klaus Leikert, Gummersbach, and Klaus-Dieter Rennert, Marienheide, both of Fed. Rep. of Germany, assignors to L. & C. Steinmüller GmbH, Gummersbach, Fed. Rep. of Germany

Filed Feb. 12, 1982, Ser. No. 348,251

Claims priority, application Fed. Rep. of Germany, Feb. 16, 1981, 3105628

Int. Cl.³ F23D *1/00*

U.S. Cl. 110—347 2 Claims



1. A method for supplying solid, pulverized fuel to a pulverized-fuel pilot light of an annular flame, coal dust burner, said method comprising the steps of:

A. supplying the coal dust burner with a fuel stream comprising a mixture of pulverized fuel and carrier air from a pulverizing plant via a main fuel supply conduit, wherein the stream has a cross-section with areas of pulverized fuel having different grain sizes;

B. selectively withdrawing a portion of the pulverized fuel and carrier air at a withdrawal site in the main fuel supply conduit; the withdrawal being from a selected location in the cross-section of the stream of pulverized coal and carrier air and being made through a withdrawal opening which faces in the upstream direction with respect to the direction of flow of the stream so as to withdraw pulverized fuel of a grain size different from that comprising the cross-section of the entire stream;

C. separating the withdrawn pulverized fuel from the carrier air and returning the carrier air to the main conduit at a location downstream from the site of the withdrawal;

D. feeding the withdrawn pulverized fuel to a storage bunker for a subsequent burning by the pilot light;

E. feeding the withdrawn pulverized fuel from the storage bunker to the pilot light when the coal dust burner is extinguished wherein a flame is available for reigniting the coal dust burner when ignition is necessary, and

F. withdrawing additional portions of pulverized fuel in accordance with step "B" to keep a sufficient supply of pulverized fuel of selected grain size in the storage bunker for use by the pilot light when the coal dust burner is extinguished.

4,426,939

METHOD OF REDUCING NO_x AND SO_x EMISSION

Ralph D. Winship, Ottawa, Canada, assignor to Combustion Engineering, Inc., Windsor, Conn.

Filed Mar. 21, 1983, Ser. No. 476,947

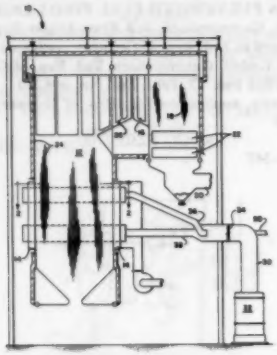
Claims priority, application Canada, Jun. 8, 1982, 408899

Int. Cl.³ F23K *1/00*; F23D *1/00*

U.S. Cl. 110—347 5 Claims

1. The method of operating a furnace including the steps of conveying pulverized coal in an airstream towards a furnace, separating the stream into two portions, one being a fuel rich portion, and the other being a fuel lean portion, introducing the fuel rich portion into the furnace in a first zone, introducing air into the first zone in a quantity insufficient to support complete combustion of all of the fuel in the fuel rich portion, introducing the fuel lean portion into the furnace in a second zone located at a higher elevation than the first zone, introducing air into the second zone in a quantity sufficient to support com-

plete combustion of all of the fuel in both the fuel rich and fuel lean portions, so as to minimize the peak temperature within



the furnace, and also minimize the formation of NO_x and SO_x in the combustion gases.

4,426,940

IMPLEMENTS FOR INJECTING SUBSTANCES BELOW THE SURFACE OF THE SOIL

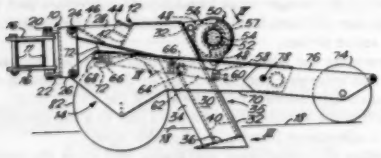
David M. Brain, Sampford Peverell, and Gerald M. Frankpitt, Tiverton, both of England, assignors to Twose of Tiverton Limited, Tiverton, England

Filed Jan. 11, 1982, Ser. No. 338,293

Claims priority, application United Kingdom, Jan. 12, 1981, 8100746

Int. Cl.³ A01C *23/02*

U.S. Cl. 111—7 **7 Claims**



1. Apparatus for injecting slurry beneath a soil surface comprising

a rigid frame adapted to be traversed over the soil in which the slurry is to be injected;

a tine displaceable through said soil in a predetermined direction of travel in a vertical plane containing said direction of travel through the soil and including a substantially straight working shank portion provided with a longitudinally extending duct, said shank portion being adapted for extending into the soil;

a pivotal mounting means for mounting the tine on the rigid frame to permit the tine to rock in the said vertical plane;

a loading spring for biasing the tine to a working attitude in which the straight working shank portion inclines to the surface of the soil at an acute angle;

a generally upwardly convex arched shoe increasing in height and width from front to rear relative to said direction of travel and secured to the tine and including a top provided with an aperture registering with the duct in the shank portion of the tine;

means for feeding slurry into the duct;

a vibrator means on the shank portion of the tine for inducing vertical vibrations therein; and

a reaction lever pivoted on the rigid frame and extending rearwards relative to said direction of travel to a point behind the tine and including an anchorage for the loading spring so located as to urge the rear end of the reaction lever downwardly against the soil under the reaction force of the loading spring.

4,426,941

EMBROIDERY MACHINE PATTERN MECHANISM

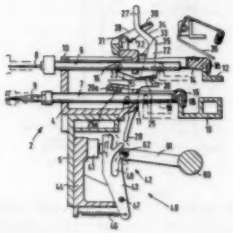
Georg Comploi, Bludenz, Austria; Roland Heimgartner, Arbon, Switzerland; Artur Loacker, Goetzis, Austria; Kurt Huber, Arbon, and Hans Wallimann, Goldach, both of Switzerland, assignors to Aktiengesellschaft Adolf Saurer, Arbon, Switzerland

Filed Feb. 2, 1982, Ser. No. 345,091

Claims priority, application Switzerland, Feb. 4, 1981, 730/81

Int. Cl.³ D05C *11/06*

U.S. Cl. 112—84 **16 Claims**



1. An embroidery machine comprising:

embroidering implement rods mounted in at least two rows and displaceably guided at the embroidery machine;

a respective oscillatingly driven drive rail operatively associated with at least predetermined ones of the embroidering implement rods of a given row;

each of said embroidering implement rods being operatively connectable with its operatively associated oscillatingly driven drive rail in that each said embroidering implement rod can be selectively coupled or decoupled from its related drive rail;

means for operatively connecting each of said embroidering implement rods to its related oscillating drive rail;

said operatively connecting means comprising a common switching lever for simultaneously coupling to or decoupling from the related operatively associated drive rail two of said embroidering implement rods which are related to the same embroidery location;

said common switching lever being manually actuatable; and

means including an electromagnetic device for automatically actuating said common switching lever.

4,426,942

EYE SHANK BUTTON ATTACHING APPARATUS

Nils O. Nestenius, Helsingborg, Sweden, assignor to Styrteknik Olof Nestenius AB, Sweden

PCT No. PCT/EP80/00027, § 371 Date Jan. 16, 1981, § 102(e) Date Jan. 16, 1981, PCT Pub. No. WO80/02550, PCT Pub. Date Nov. 27, 1980

PCT Filed May 17, 1980, Ser. No. 229,601

Claims priority, application United Kingdom, May 18, 1979, 7917376

Int. Cl.³ B68G *7/08*; D05B *3/16*

U.S. Cl. 112—108 **11 Claims**

1. Apparatus for looping tying material about the eye of a button comprising:

means for supporting a button having a front side and an eye or eye shank extending outwardly from a reverse side thereof,

means for passing a doubled length of tying material through

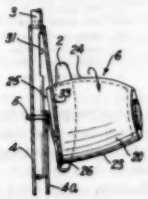
the eye of a button supported by the supporting means, and

means for looping one of the two strands of a said doubled length of tying material about the eye or eye shank of a said button,

the looping means comprising an arcuate member which partially surrounds a button supported by the button supporting means when the apparatus is in use and having a base portion mounted on one end of a shaft which is rotatable to rotate the looping means and an arcuate wall which extends both axially and radially outwards from said base portion, the arcuate wall having a leading edge, a trailing edge and an arcuate outer edge remote from the base portion and extending between the leading and trailing edges,

a cut-out in said arcuate wall at the junction of the leading edge with the arcuate outer edge to form a shoulder,

both the leading edge and the trailing edge being inclined relative to a plane in which the axis of rotation of the looping means lies, the leading edge being inclined from



the base portion away from the direction of rotation of the looping means and the trailing edge being inclined from the base portion toward the direction of rotation of the looping means,

said shoulder being adapted to engage a said one strand of a doubled length of trying material beyond where the tying material passes through the eye of the button, the looping means being rotatable about an axis which is inclined relative to the axis of a button supported by said supporting means when the apparatus is in use whereby said one strand will be carried by said shoulder around the eye or eye shank of the button first in a direction from the reverse side towards the front side of the button so that a loop is formed in said strand around the looping means to maintain the strand in engagement with said shoulder, then in a direction from the front side towards the reverse side of the button to disengage the loop from the looping means and finally again in a direction from the reverse side towards the front side of the button to disengage the strand from said shoulder.

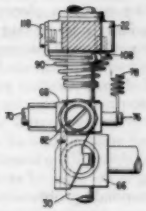
4,426,943

ADJUSTABLE CUSHIONING SPRING FOR A SEWING MACHINE

Edilberto Cantada, East Brunswick, N.J., assignor to The Singer Company, Stamford, Conn.

Filed May 7, 1982, Ser. No. 375,923
Int. Cl.³ D05B *3/02*
U.S. Cl. 112—221 **5 Claims**

1. In a sewing machine, a needle bar, a movable gate including an arm in which the needle bar is supported for endwise reciprocation, latching means carried on the needle bar, actuating means for imparting endwise recirpocatory motion to the needle bar through said latching means, means for unlatching the latching means from said actuating means, elevating spring means for raising the needle bar when unlatched from the actuating means, a fixed member on the needle bar, a cushioning coil spring disposed coaxially with respect to the needle bar for engagement by said fixed member, and a ring which is affixed to the cushioning spring, the ring including an upstanding ear, said ring being adjustable on the gate and being securable thereto with a fastener extending through the ear for



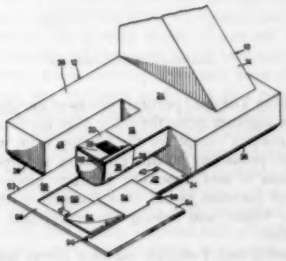
affixing the cushioning spring is a selected longitudinal position along the axis of the needle bar.

4,426,944

SEWING MACHINE HAVING A SUPPLEMENTAL WORK SUPPORTING SURFACE

Nereo Bianchi, Pavia, Italy, assignor to Necchi Societa per Azioni, Pavia, Italy

Filed Feb. 20, 1981, Ser. No. 236,511
Claims priority, application Italy, Feb. 29, 1980, 42906 A/80
Int. Cl.³ D05B *73/10*
U.S. Cl. 112—260 **5 Claims**



1. In a sewing machine with a work supporting surface having a front side, said surface being convertible into a free arm, comprising a bed provided with a cantilevered arm containing a bobbin hook, a door pivoting on said cantilevered arm to rotate from a closed position to an opened position for access to said hook, a movable work supporting surface adapted to take an operatively raised position and an operatively lowered position at which lowered position the free arm is completely accessible, said work supporting surface comprising a U-shaped element, a plate slidable on suitable guides positioned on the front side of the work supporting surface, means connected to said plate and means connected to said door to couple with said plate means to allow the opening and/or closing of said door every time that the said plate is urged to take the extreme position of its stroke.

4,426,945

METHOD FOR MANUFACTURE OF FEATHER QUILT

Kuo A-Yan, 8-1 Fu Chung Rd., 8 Lin Yushow Lee, Panchiao, Taipei Hsien, Taiwan

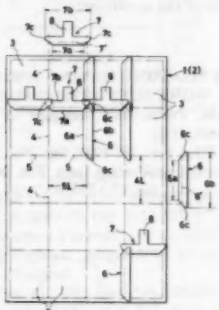
Filed Apr. 8, 1983, Ser. No. 483,632
Int. Cl.³ D05B *97/00*; B32B *7/08*
U.S. Cl. 112—262.1 **3 Claims**

1. A method for the manufacture of a feather quilt by the steps of attaching partition pieces to the upper and lower cloth layers of an equal size of a quilt enclosure along longitudinally and laterally spaced lines thereby forming rectangular spaces

arrayed in regular rows and files in the interspace between said upper and lower cloth layers of the quilt enclosure and blowing down into said rectangular spaces, which method comprises:

sewing ribbonlike partition pieces by one edge portion thereof to the inner sides of said upper and lower layers along all the boundaries of said rectangular spaces running in either of the two perpendicularly intersecting directions and sewing T-shaped partition pieces, which comprise a partition portion and a projecting portion protruding in one direction from the central portion of said partition portion, by one edge portion of said partition portion to said inner sides along all the boundaries of said rectangular spaces running in the other of said intersecting directions,

sewing the corresponding ribbonlike partition pieces of the upper and lower layers together along the other edge portion thereof and, at the same time, sewing the corresponding T-shaped partition pieces of the upper and lower layers together along the other edge portion of said partition portion except for the portion from which said T-shaped projecting portion protrudes, superposing the end portions of said ribbonlike partition pieces and said T-shaped partition pieces both fastened to the upper and lower layers, and sewing the superposed end portions together,



superposing said T-shaped partition pieces fastened to said upper and lower layers and sewing the opposite lateral sides of said projecting portions of said T-shaped partition pieces thereby forming openings along the edges of said projecting portions, and

inserting a down injection tube through said openings formed of said T-shaped projecting portions in lateral sides of said rectangular spaces and blowing the down sequentially into the interiors of said rectangular spaces.

4,426,946

STITCH CONTROL METHOD OF ELECTRONIC SEWING MACHINE

Hideaki Takenoya, Hachioji; Mikio Inamori, Hino, and Hachiro Makabe, Kanagawa, all of Japan, assignors to Janome Sewing Machine Co. Ltd., Tokyo, Japan

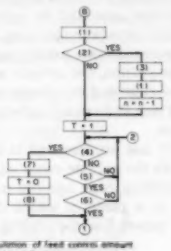
Filed Mar. 8, 1982, Ser. No. 356,158

Claims priority, application Japan, Mar. 11, 1981, 56-33847

Int. Cl.³ D05B *3/02*

U.S. Cl. 112—266.1 **1 Claim**

1. In a stitch control method in operation of a sewing machine of the type having stitch forming instrumentalities, a microcomputer having an electronic memory storing stitch control signals including data for controlling a needle position and a fabric feed of the sewing machine to produce a series of stitches of a selected pattern, a needle position control motor and a fabric feed control motor which respectively control the needle position and the fabric feeding movement, said microcomputer controlling the needle position and the fabric feed control motors such that said microcomputer reads out the stitch control signals from the electronic memory at predetermined rotation phases of the sewing machine to programmingly control the stitches of a selected stitch pattern and a repeated formation of the pattern, said microcomputer seeking a feed control amount from the difference between the last feed control data and the preceding feed control data, and a needle control amount from the difference between the last needle control data read out subsequently to the last feed control data and the needle control data read out in precedence of the last needle control data, said microcomputer employing the preceding needle control data in place of the last needle control data upon identification of the total value of the feed control amount and the needle control amount to be over a predetermined value, to thereby control the stitches of the selected pattern.


(1) Calculation of feed control amount
(2) Calculated feed control amount
(3) Feed control ← 15
(4) Feed control phase
(5) Sewing machine is OFF
(6) Needle control phase
(7) Output of feed control data
(8) Preceding feed control data ← feed control

4,426,947

SEWING MACHINES

Eric J. Marshall, 5 Carlton Gardens, London SW1, England

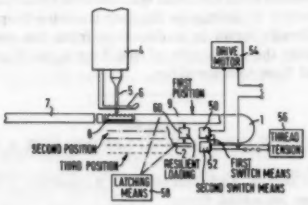
PCT No. PCT/GB80/00166, § 371 Date Jun. 10, 1981, § 102(e) Date Jun. 10, 1981, PCT Pub. No. WO81/01020, PCT Pub. Date Apr. 16, 1981

PCT Filed Oct. 15, 1980, Ser. No. 276,353

Claims priority, application United Kingdom, Oct. 15, 1979, 7935670; Oct. 15, 1979, 7935671; Oct. 15, 1979, 7935672

Int. Cl.³ D05B *69/10, 69/22, 47/00*

U.S. Cl. 112—272 **7 Claims**



1. A sewing machine comprising:

(i) a body structure including an overhead arm,

(ii) a work presser foot supported by said overhead arm,

(iii) a work support platen carried by said body structure and having a reciprocable feed dog disposed below and aligned with said presser foot, said work support platen being movable with respect to said body structure into a first position in which said feed dog is adjacent to the underside of said presser foot and into a second position in which said dog is spaced further below said presser foot, and

(iv) resilient loading means coupled to and acting between

said body structure and said work support platen and urging said platen and feed dog towards said first position.

7. A sewing machine comprising:

(i) a body structure including an overhead arm,

(ii) a work pressure foot supported by said overhead arm,

(iii) a work support platen carried by said body structure and having a reciprocable feed dog disposed below and aligned with said presser foot, said work support platen being movable with respect to said body structure into a first position in which said feed dog is adjacent to the underside of said presser foot and into a second position in which said feed dog is spaced further below said presser foot and into a third position below said second position,

(vi) latching means on said body structure arranged to latch said platen releasably in said second position and in said third position,

(v) resilient loading means coupled to and acting between said body structure and said work support platen and urging said platen and feed dog towards said first position,

(vi) a drive motor having a current feed circuit,

(vii) first switch means on said body structure operable by said platen and included in said current feed circuit, said first switch means being arranged to open said current feed circuit when said platen moves downwardly into said second position,

(viii) second switch means on said body structure disposed in said current feed circuit and operable by said platen, said second switching means being arranged to become open circuit when said platen moves downwardly into said third position.

4,426,948

YARN DETECTOR FOR SHORT SEAM SEWING MACHINES

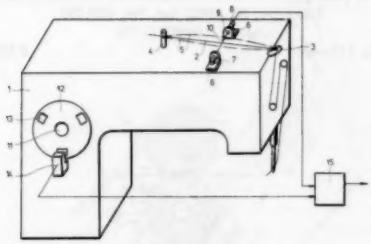
Sandor Olasz; Denes Szalay; Jozsef Kovacs, and Oliver Kocsis, all of Budapest, Hungary, assignors to Csepel Muvek Jarmu es Konfekcioipari Gepgyara, Budapest, Hungary

Filed May 19, 1981, Ser. No. 265,083

Claims priority, application Hungary, May 28, 1980, 1338/80

Int. Cl.³ D05B *69/36*

U.S. Cl. 112—273 **5 Claims**



1. In a detector for short seam sewing machines (1) provided with thread guides (3 and 4), a control disc having a driving shaft (11) and a control unit, wherein a yarn (2) drawn through said thread guides (3 and 4) swings between the thread guides (3 and 4) in the course of sewing; the improvement comprising

a light source (7) and a light-sensing device (8) for detecting the swinging of the yarn; another disc (12) fixed on the driving shaft (11) of said control disc and having as many openings (13) as there are short seams to be made during one revolution of said control disc;

parallel to the disc (12), a detector (14) observing the openings (13) of the disc (12); and an output of the light-sensing device (8) and an output of the detector (14) being connected to a control circuit (15) electrically connected to said control unit of the sewing machine (1).

4,426,949

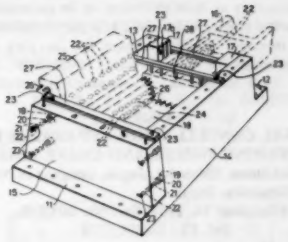
METHOD FOR MAKING ELONGATE CAST CONSTRUCTION ON THE SEA

Einar Knutsen, Astrupsvei 36, 5032 Minde, Norway

Division of Ser. No. 103,467, Dec. 14, 1979, Pat. No. 4,327,656. This application Dec. 14, 1981, Ser. No. 330,764

Int. Cl.³ B63C *1/02*; B63B *5/14*

U.S. Cl. 114—47 **4 Claims**



1. A method for making an elongate cast construction in a dock floating on the sea and having upwardly and inwardly facing panels defining a work chamber and comprising the steps of providing fixed fastener receiving members in said panels, positioning boarding members within said work chamber, assemblying said boarding members with said dock to define a mold cavity by inserting fasteners through said boarding members and engaging said fasteners in associated fastener receiving members, introducing molding material into said mold cavity, removing said fasteners and at least some of said boarding members from assembly with said dock after said molding material has hardened to form a first part of said elongate cast construction, removing an end panel from said dock, pushing a portion of said first part outward through the open end of the dock from said work chamber and into the sea, securing said first part to said dock by inserting fasteners through voids in said first part formed by removal of fasteners and engaging the inserted fasteners with associated fastener receiving members, and casting a second part of said elongate construction within said work chamber as a continuation of said first part.

4,426,950

SUPPORTING SYSTEM FOR APPARATUSES DESTINED TO BE MOVED UNDER WATER

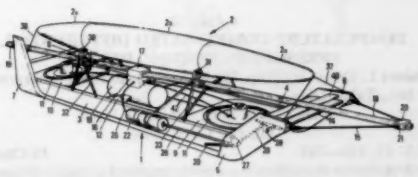
Jacques Cholet, L'Etang-la-Ville, France, assignor to Institut Francais du Petrole, Rueil-Malmaison, France

Continuation of Ser. No. 23,979, Mar. 26, 1979, abandoned. This application Jun. 10, 1981, Ser. No. 272,241

Claims priority, application France, Mar. 24, 1978, 78 09196

Int. Cl.³ B63G *8/14*

U.S. Cl. 114—245 **18 Claims**



1. A system for carrying apparatuses to be displaced under water at a substantially constant submersion depth when towed from a ship, comprising at least one supporting device provided with a movable flap whose orientation is monitored by control means responsive to variations in submersion depth

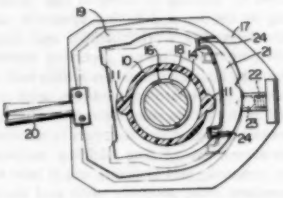
for controlling the submersion of the supporting device, each supporting device comprising the combination of a rigid support adapted for carrying said apparatuses thereon and comprising at least two plates laterally fastened to two longitudinal elongate members, an apparatus of said apparatuses carried by a first plate of said rigid support and a control assembly of said apparatus carried by a second plate thereof, the movable flap being arranged between the two elongate members and at the head of the support, and an elongate floating element, having a positive buoyancy at least sufficient to be maintained at the surface when not in use, maintained at a certain distance above the support through fastening means for carrying said rigid support underwater.

4,426,951

TURN SIGNAL CANCELLATION APPARATUS FOR USE WITH STEERING WHEEL AND SHAFT ASSEMBLY

Kazuyoshi Nishizima, Shizuoka, Japan, assignor to Nihon Plast Co., Ltd., Shizuoka, Japan

Filed Sep. 14, 1981, Ser. No. 301,575
Int. Cl.³ H01H *3/18*
U.S. Cl. 116—46 **6 Claims**



1. A turn signal cancellation apparatus for use with a steering wheel and shaft assembly having a steering wheel boss to which the steering shaft is secured, said apparatus comprising a boss cover of a plastic material extending around said steering wheel boss and secured thereto, said boss cover including a surface portion extending transversly with respect to said boss and a turn signal cancellation cam, said boss cover including at least one cam actuating portion integral with said cover and extending from said surface portion thereof and a reinforcing portion disposed substantially radially inwardly of said cam actuating portion and extending from said surface portion of said boss cover, said reinforcing portion being integral with said boss cover and said cam actuating portion, said cam actuating portion being movable along a circular path about the axis of said steering shaft when said steering wheel is rotated, said cam having at least one contact portion and being operable by a turn indicator lever means so that said contact portion is moved into the path of movement of said cam actuating portion of said boss cover whereby said cam can be returned to its initial neutral position by engagement of said cam actuating portion with said contact portion of said cam.

4,426,952

TEMPERATURE COMPENSATED DIFFERENTIAL PRESSURE INDICATING DEVICE

Robert L. Crisp, Jr., Troy, Mich., assignor to Facet Enterprises, Inc., Tulsa, Okla.

Filed Feb. 9, 1981, Ser. No. 232,485
Int. Cl.³ G01L *9/14*
U.S. Cl. 116—267 **10 Claims**

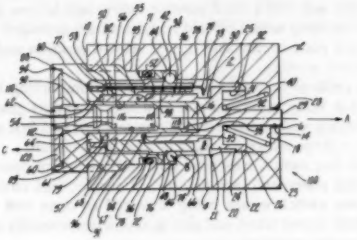
1. A device for indicating a predetermined pressure differential between inlet and outlet pressures, said device comprising:

a case member having one end, an opposite end and portions defining a chamber extending from said one end toward said opposite end and a passage formed in said opposite end and extending to said chamber for flow communication therebetween;

a first opening in said case member communicating with said chamber and connected to the inlet pressure;

a second opening in said case member adjacent but spaced away from said first opening and communication with said chamber and connected to the outlet pressure;

a piston centrally disposed in said chamber, said piston further being responsive to a predetermined pressure differential between said first and second openings for movement within said chamber from a first position to a second position, said piston further having a piston head extending transversely across said chamber;



indicator means, centrally disposed in said chamber for indicating said pressure differential between said first and second openings such that above a predetermined pressure level differential said indicator means moves from a nonindicating position to an indicating position;

biasing means for urging said piston towards said first position; and

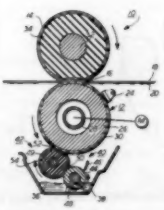
temperature sensitive means, for preventing movement of said indicator means to said indicating position below a predetermined fluid temperature when said piston moves from said first position to said second position.

4,426,953

HEAT PRESSURE FUSER APPARATUS

Alvin D. Kromm, Jr., Webster, and Rabin Moser, Fairport, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Jul. 30, 1982, Ser. No. 403,453
Int. Cl.³ B05C *11/00*
U.S. Cl. 118—60 **8 Claims**



1. A release agent management system for applying liquid release agent material to the surface of a rotating heated fuser roll, said system comprising:

a rotatable donor roll contacting said heated roll for applying said release agent material to said heated roll;

a rotatable metering roll contacting said donor roll and for contacting said release agent material contained in a sump for applying said release agent material to said donor roll;

a metering blade supported in contact with said metering roll for metering the release agent material picked up from said sump to a predetermined level; and

means for dislodging paper related residue from said meter-

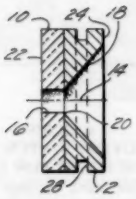
ing blade and transporting it toward one end of said metering blade.

4,426,954

APPLICATING DIE DEVICE

Ronald E. Keller, Celina, Ohio, assignor to Indiana Wire Die Company, Inc., Fort Wayne, Ind.

Filed Sep. 27, 1982, Ser. No. 423,718
Int. Cl.³ B05C 11/02
U.S. Cl. 118—125 **4 Claims**



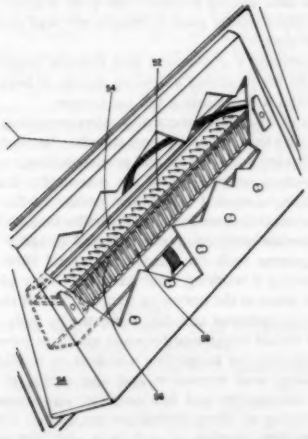
1. An application device for use in coating a strand comprising a die assembly of two elements having contiguous flat surfaces which are securely laminated together, said die assembly having a bore through both elements which is of essentially uniform diameter through one of said elements and tapered through the other of said elements; said one element being of polycrystalline synthetic diamond material and said other element being carbide, the other surface of said one element being flat, said assembly being in two halves abuttingly engaged along a plane which diametrally divides said bore.

4,426,955

IDENTIFICATION AND ANIMAL FEEDING APPARATUS

Marvin E. Monroe, and William T. Kavage, both of Sunbury, Ohio, assignors to Optek, Inc., Galena, Ohio

Filed Dec. 16, 1981, Ser. No. 331,233
Int. Cl.³ A01K 5/02
U.S. Cl. 119—51 R **12 Claims**



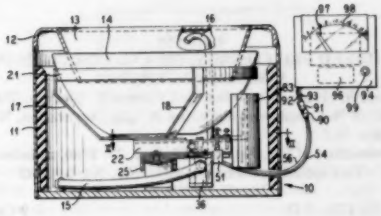
1. An identification apparatus for electronically detecting a code on one of a plurality of coded objects and comprising:
(a) a plurality of spaced reed switches mounted to a support capable of receiving a coded object in a plurality of positions;
(b) a coded object having a plurality of positions spaced substantially the same as the spacing of said reed switches, but of a lesser number than said plurality of said reed switches, said object having magnets mounted at selected ones of said positions for forming said code; and
(c) electronic means connected to said reed switches for detecting which of said reed switches are closed when said coded object is juxtaposed to any lineal sequence of said reed switches.

4,426,956

WATER VOLUME INDICATOR FOR AN ANIMAL WATERER

James E. McKinstry, Cedar Rapids, Iowa, assignor to Nelson Manufacturing Company, Cedar Rapids, Iowa

Filed Jul. 21, 1982, Ser. No. 400,379
Int. Cl.³ A01K 7/00
U.S. Cl. 119—72 **8 Claims**



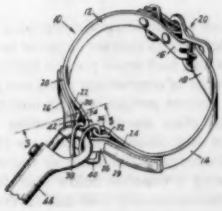
1. An animal waterer comprising, a frame member, a fluid reservoir, a balanced beam pivotally mounted on said frame member and said reservoir mounted on said beam, a fluid supply valve mounted on said frame and connectible to a fluid supply and with an outlet for supplying fluid to said reservoir and having an actuator engageable by said balanced beam when it moves due to insufficient fluid in said reservoir, a switch mounted on said frame and having a switch actuator engageable by said balanced beam to close it when it moves due to insufficient fluid in said reservoir and an indicator connected to said switch and actuated thereby to indicate the time the valve is open to supply fluid.

4,426,957

SAFETY RELEASE PET COLLAR

Richard Horrigan, Stormfield, Rte. 107, West Redding, Conn. 06896

Filed Jun. 16, 1982, Ser. No. 388,802
Int. Cl.³ A01K 27/00
U.S. Cl. 119—106 **9 Claims**



1. A safety-release pet collar comprising, in combination:
(a) a two-piece band in the form of a flat strip of foldable and penetrable material, said band being adapted to encircle the pet's neck,
(b) one pair of adjoining ends of the bands having cooperable buckle means to enable the normal applying and removing of the band from the pet to be effected,

(c) the remaining pair of adjoining ends of the band having folded-back portions respectively forming closed loops,

(d) said remaining pair of adjoining ends of the bands further having cooperable, force-release connectors constituted of strips of cooperable, attachable and releasable, loop-and-hook material, said connectors being adapted to become free from each other in response to experiencing excessive forces such as would occur if the band should become caught on a branch of other object and the pet struggles to be freed,

(e) said folded-back portions of the band and said loop-and-hook strips being secured together by fastening means passing through them, and

(f) a pair of juxtaposed rings extended respectively through said closed loops, for receiving a leash means adapted to confine said rings against separation and thereby prevent separation of the remaining pair of adjoining ends of the band.

4,426,958

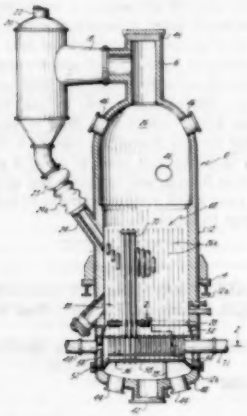
FLUIDIZED BED COMBUSTOR AND COAL GUN-TUBE ASSEMBLY THEREFOR

William S. Hosek, Mt. Tabor, and Edward J. Garruto, Wayne, both of N.J., assignors to Curtiss-Wright Corporation, Wood-Ridge, N.J.

Continuation of Ser. No. 201,288, Oct. 27, 1980, abandoned. This application Jan. 21, 1982, Ser. No. 341,462

Int. Cl.³ F28D *13/00*

U.S. Cl. 122—4 D **9 Claims**



1. A fluidized bed combustor comprising

a housing defining an interior chamber having an upper and lower portion, said upper portion having a top portion for the discharge of combustion gases and said lower portion having a bottom portion with an outlet for cooling fluid,

a distributor plate assembly extending across the lower portion of said chamber including a plurality of tuyeres for the discharge of fluidizing air therethrough,

means defining a windbox below said distributor plate assembly communicating with said tuyeres,

means defining a heat exchanger inlet plenum below said windbox including a plurality of tubes extending therethrough for the passage of air to said windbox,

means defining a lower section below said heat exchanger inlet plenum with a connection to an air supply means for supplying air through said plurality of tubes to said windbox,

heat exchanger means adapted to extend above said distributor plate assembly and being mounted in said lower portion of said chamber, said heat exchanger means including a plurality of heat exchange elements,

means defining a fluidizing bed area extending from above the distributor plate assembly to the vicinity of the upper portion of said heat exchanger means, and at least one coal supply gun assembly extending through said housing and terminating in said chamber above said distributor plate assembly, and

said at least one coal supply gun assembly comprising a plurality of discharge means arranged to only discharge the granular coal material between adjacent heat exchange elements.

4,426,959

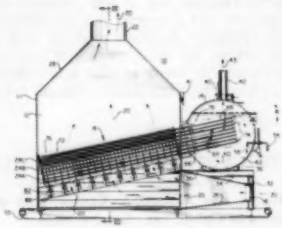
WASTE HEAT RECOVERY SYSTEM HAVING THERMAL SLEEVE SUPPORT FOR HEAT PIPE

Jack McCurley, Dallas, Tex., assignor to Q-dot Corporation, Dallas, Tex.

Filed Jul. 1, 1980, Ser. No. 165,059

Int. Cl.³ F22B *1/18, 3/02*

U.S. Cl. 122—33 **13 Claims**



1. In combination:

a boiler tank having a water inlet port, a steam discharge port, and a header plate forming a side wall portion of the boiler tank;

means forming a convection heat transfer chamber having an inlet for receiving a flowing stream of heated gas and an outlet for exhausting the gas stream;

a group of heat pipes thermally interconnecting the boiler tank with the convection heat transfer chamber, each heat pipe having a first sealed end portion defining an evaporator section extending into the convection heat transfer chamber, a second sealed end portion defining a condenser section extending into the boiler tank, an intermediate portion projecting through and coupled in sealing engagement with the header plate, and each heat pipe containing a working fluid having a vapor phase and a liquid phase at the operating temperatures of the evaporator and condenser sections, respectively; and,

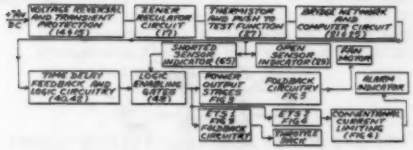
support means interposed between said heat pipes and said header plate for supporting said heat pipes while accommodating axial expansion and contraction of said heat pipes relative to said header plate, said support means comprising an elongated sleeve interposed between the intermediate portion of each heat pipe and said header plate, said sleeve having a wall portion coupled in sealed engagement with said header plate, a first end portion coupled in sealed engagement with said heat pipe, and a major portion of said sleeve being spaced from said intermediate portion of each heat pipe, respectively, and defining an enclosed insulating air space between said sleeve and said heat pipe.

4,426,960

CONTROL CIRCUITRY FOR MULTISTAGE FANS

Robert E. Hart, Clearwater, Fla., assignor to Square D Company, Palatine, Ill.

Continuation of Ser. No. 83,034, Oct. 9, 1979, abandoned. This application Aug. 24, 1982, Ser. No. 411,136
Int. Cl.³ F01P 7/12, 11/16
U.S. Cl. 123—41.49 3 Claims


VOLTAGE REVERSAL AND TRANSIENT PROTECTION (14,15,25)
ZENER REGULATOR CIRCUIT (21)
THERMISTOR AND PUSH TO TEST FUNCTION (22)
BRIDGE NETWORK AND COMPUTER CIRCUIT (23,24,25)
SHORTED SENSOR INDICATOR (65)
OPEN SENSOR INDICATOR (69)
FAN FAILURE
TIME DELAY FEEDBACK AND ERROR CIRCUITRY (40,45)
LOGIC ENABLING GATES (48)
POWER OUTPUT STAGES FIG 3
FEEDBACK CIRCUITRY FIG 5
ALARM INDICATOR
FIG 8 FEEDBACK CIRCUITRY
FIG 7
FIG 6
CONVENTIONAL CURRENT LIMITING (FIG 4)

1. A multistage temperature control circuit for maintaining engine manifold coolant at a selected temperature by selectively operating a plurality of cooling fans mounted to provide a flow of cooling air to said engine, said circuit comprising:

means to selectively energize said fans to operate to maintain the engine manifold cooling liquid below a selected temperature level;

sensing element means immersed in the manifold coolant for providing electrical signals proportional to the coolant temperature including a thermistor probe for sensing the coolant temperature, means responsive to said signals for enabling a first of said cooling fans at a predetermined temperature;

means for sequentially enabling additional fans as the coolant temperature increases including a differential circuit comprising a plurality of differential amplifiers means and a resistor bridge circuit, said thermistor providing a first input to each of said differential amplifiers, and said resistor bridge circuit providing selected level inputs as the second input to each of said differential amplifiers;

time delay circuitry for sequencing the operation of the cooling fans in accordance with a predetermined delay,

means for by-passing said time delay circuitry to selectively energize said fans sooner than said predetermined delay when the temperature cycles rapidly; and a delay circuit connected to receive an input from a first fan, said delay circuit comprising an RC network, a logic AND gate having two inputs and input, the input from said first fan causing the RC network to charge to a high level after a first period of time delay and providing a first input to said AND gate, said thermistor providing a high logic level to said AND gate, and as the temperature rises to the energizing point of a succeeding fan, the other input to the AND gate goes high to turn ON said succeeding fan as the temperature decreases, the low logic level applied to the AND gate and said succeeding fan being turned OFF due to said first fan remaining engaged to enable said succeeding fan to be reactivated without the time delay when the temperatures again rises.

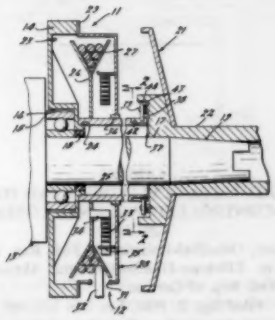
4,426,961

STARTING ARRANGEMENT FOR INTERNAL COMBUSTION ENGINE

James E. Grinde, Anoka, Minn., assignor to Yamaha Hatsudoki Kabushiki Kaisha, Iwata, Japan

Filed Oct. 16, 1981, Ser. No. 312,334
Int. Cl.³ E02N 17/00
U.S. Cl. 123—179 SE 4 Claims

1. In a recoil starting arrangement for an internal combustion engine of a powered vehicle, said engine having an engine housing including a non-rotatable engine wall, an output shaft extending through said wall of said engine housing, said wall having an outwardly extending projection, bearing means supported within said projection and journaling said output shaft, and a driven element affixed to said output shaft contiguous to said wall and outwardly of said projection, the improvement comprising a recoil starter mechanism interposed between said wall and said driven element and cooperatable with said output shaft for pull starting of said engine, said engine wall defining a recess extending around said wall projection and the extending portion of the output shaft, the starting mechanism including a rope pulley extending in part into said engine wall recess, a cover affixed to said wall and enclosing



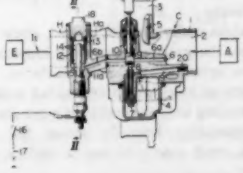
said recess and said rope pulley, said wall defining a shoulder extending around the output shaft and disposed radially inwardly of the wall recess and outwardly from said projection, said rope pulley being affixed to a starter hub rotatably supported at one end thereof by said wall shoulder, said cover defining a central opening encircling the starter hub, and a bushing interposed between said cover opening and said starter hub for journaling said starter hub.

4,426,962

STRUCTURE FOR FACILITATING STARTING AND WARMING OF INTERNAL COMBUSTION ENGINES

Junji Otani, Oomiya; Akira Okubo, and Takashi Kushibiki, both of Tokyo, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 12, 1982, Ser. No. 367,355
Claims priority, application Japan, Apr. 13, 1981, 56-55271
Int. Cl.³ F02M 1/08
U.S. Cl. 123—179 H 7 Claims



1. A structure for facilitating starting and warming of an internal combustion engine, comprising an intake passage, a carburetor inserted in said intake passage and having a main fuel supply system with a throttle valve therein, and a heating system disposed independently from said main fuel supply system for producing a heated gaseous mixture to be fed into the engine, said heating system including a side passage connected to said intake passage and separate therefrom, by-passing said throttle valve, a fuel nozzle for controlling the fuel in said side passage, a control valve disposed in said side passage for opening and closing said side passage, a heating chamber

formed in said side passage on the downstream side of said control valve, and a heating element disposed in said heating chamber for heating a gaseous mixture generated in said side passage, and thereby converting said gaseous mixture into a combustible gaseous mixture, wherein fuel flow in said side passage is independent of fuel flow in said intake passage.

4,426,963

LIGHT METAL CYLINDER HEAD FOR A VALVE-CONTROLLED INTERNAL COMBUSTION ENGINE

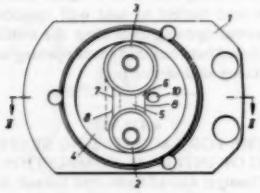
Emil Lichtner, Odenthal-Voiswinkel, Fed. Rep. of Germany, assignor to Klöckner-Humboldt-Deutz Aktiengesellschaft, Cologne, Fed. Rep. of Germany

Filed Sep. 3, 1981, Ser. No. 298,946

Claims priority, application Fed. Rep. of Germany, Sep. 13, 1980, 3034591

Int. Cl.³ F02F *1/26*

U.S. Cl. 123—193 H **1 Claim**



1. An improvement in an aluminum alloy cylinder head for a valve-controlled internal combustion engine, said cylinder head having a bottom surface which faces into an associated combustion chamber, the bottom surface having a pair of spaced valve openings therethrough defining an area therebetween on the bottom surface which is subject to crack propogation, said cylinder head also having a bore disposed through the area for receiving one of the group consisting of an ignition related device and an injection-related device, the improvement comprising:

a pair of substantially parallel, spaced, stress relief grooves in said area, the grooves extending longitudinally between the valve openings and having surfaces;

a pair of spaced steel inserts embedded in the cylinder head and extending longitudinally between the valve openings while extending laterally across the bottom of the grooves, each insert having a surface exposed in the grooves;

a coating of material which is resistant to oxidation overlying the surfaces of the steel inserts which are exposed in the grooves, the coating being of a material selected from the group consisting of ceramic material and aluminum material, and

a crack-precluding aluminum oxide layer formed by anodic oxidation at a high current density on the bottom surface of the cylinder head and covering at least the area between said valve openings and the surfaces of the grooves, the oxide layer being precluded from contact with the steel inserts during formation of the layer due to protection of the inserts by the coatings.

4,426,964

RUNNER-TYPE LUBRICATING DEVICE FOR VERTICAL ENGINE

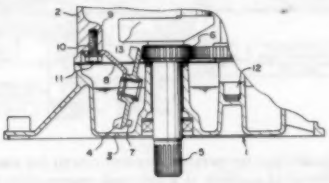
Tatsutoshi Umeda, Kawachinagano, and Yasunori Hashigaki, Sennan, both of Japan, assignors to Kubota, Ltd., Osaka, Japan

Filed Mar. 22, 1982, Ser. No. 360,147

Claims priority, application Japan, Jun. 5, 1981, 56-83584[U]

Int. Cl.³ F02F *7/00*; F02B *77/00*

U.S. Cl. 123—195 A **3 Claims**



1. An improved support for improving the relative relationship between a runner-type lubricating device and a power gear secured on a vertically supported rotary shaft of a vertical drive type engine which engine includes a crank case with an oil pan enclosure secured to said crank case, the improvement comprising a bracket, said runner-type lubricating device being mounted to said bracket near one end thereof and is rotatable relative to said power gear, said bracket including an aperture near another end thereof, fixing means extending through said aperture and extending into said crank case which secures said bracket to said crank case with said runner-type lubricating device extending into said oil pan and positioned relative to said power gear for lubricating said power gear.

4,426,965

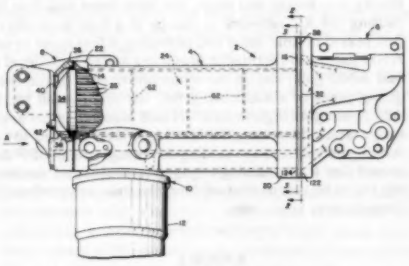
UNITIZED OIL COOLER AND FILTER ASSEMBLY

Harshad H. Patel, Columbus, Ind., assignor to Cummins Engine Company, Inc., Columbus, Ind.

Filed Feb. 11, 1982, Ser. No. 347,969

Int. Cl.³ F02M *1/00*

U.S. Cl. 123—196 AB **21 Claims**



1. An oil cooler assembly for use on an internal combustion engine having a recirculating lubrication oil circuit and a recirculating engine coolant circuit, comprising

(a) a cooler housing having a planar end surface and an elongated internal cavity one end of which opens into said planar end surface;

(b) support means for mounting said cooler housing on the engine and for providing isolated fluid flow passages between the cooler housing and the recirculating lubrication oil circuit and the recirculating engine coolant circuit;

(c) heat exchange means for causing the lubrication oil and engine coolant to flow through said cooler housing in

fluidically isolated, heat exchange relationship, said heat exchange means including

(1) a plurality of elongated tubes, and

(2) tube mounting means for mounting said tubes in spaced apart, parallel nested relationship within said housing cavity, said tube mounting means including a flat plate-like member sandwiched between said cooler housing and said support means, said flat plate-like member containing means for supporting the elongated tubes at the ends thereof and at least one oil inlet aperture through which oil flows from said support means to said cooler housing and at least one oil return aperture through which oil flows from said cooler housing into said support means.

4,426,966

PRECOMBUSTION CHAMBER IN THE CYLINDER HEAD OF A DIESEL ENGINE

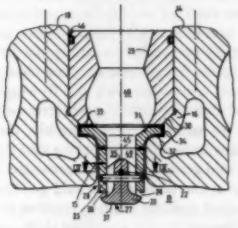
Werner Hüther, Karlsfeld, and Wolfgang Krüger, Reichertshausen, both of Fed. Rep. of Germany, assignors to MTU Motoren-und Turbinen-Union, Munich, Fed. Rep. of Germany

Filed Jun. 9, 1982, Ser. No. 386,765

Claims priority, application Fed. Rep. of Germany, Jun. 12, 1981, 3123398

Int. Cl.³ F02B *3/00*

U.S. Cl. 123—286 **6 Claims**



1. A precombustion chamber construction in a cylinder head of a diesel engine, the cylinder head bounding a main combustion chamber of the engine, said precombustion chamber construction comprising means in said cylinder head defining a precombustion chamber communicating with the main combustion chamber via a flow passage and including a member in said cylinder head provided with said gas passage and a body supported by said member and facing into said main combustion chamber to form a gas baffle for combustion products passing through the gas passage from the precombustion chamber to the main combustion chamber, a mushroom shaped body including a cap disposed in said main combustion chamber and a stem received in said member, said body and member defining a gas duct therebetween, said mushroom shaped body comprising four longitudinal webs at an angular spacing of 90 degrees, said webs projecting from said stem to said member, and at least one transversely extending pin extending through a respective pair of webs and said stem into said member and being covered by said webs in said gas duct.

4,426,967

ENGINE CHARGE AIR TEMPERATURE CLASSIFIER

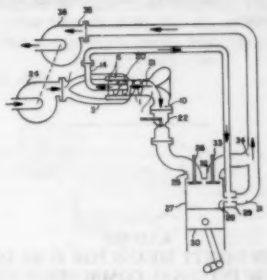
Edward M. McWhorter, 6931 Greenbrook Cir., Citrus Heights, Calif. 95610

Continuation-in-part of Ser. No. 160,577, Jun. 18, 1980, abandoned. This application Sep. 2, 1982, Ser. No. 414,395

Int. Cl.³ F02M *15/00, 31/02*

U.S. Cl. 123—315 **9 Claims**

1. An air temperature classifier comprising an inlet manifold fixedly attached to one end of a chamber, an inlet fixedly attached to said inlet manifold, said inlet being axially aligned with the longitudinal axis of said inlet manifold and said chamber, a plurality of inlet orifices between said chamber and said inlet manifold, said orifices being positioned in a slantwise direction relative to the longitudinal center of said chamber and directed tangentially to the inner surface of said chamber, a closure fixedly attached at the opposite end of said chamber, an outlet manifold, fixedly attached to said chamber immediately adjacent to the said closure, a hot outlet fixedly attached



to said oulet manifold, a collector tube centrally positioned within said chamber, said collector tube beng fixedly attached to manifolding, said manifolding being positioned within a plug, said plug being centrally positioned within said inlet manifold by diagonally placed guide vanes, a cold outlet attached to said manifolding within said plug.

4,426,968

CARBURETOR WITH MEANS FOR COMPENSATION OF IDLING REVOLUTION

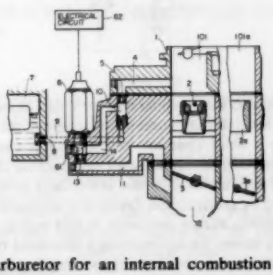
Keiichi Onuki, Hitachi; Tooru Nakagawa, Mito, and Tadashi Inoue, Katuta, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Aug. 28, 1981, Ser. No. 297,406

Claims priority, application Japan, Sep. 5, 1980, 55-123070

Int. Cl.³ F02M *11/00, 3/06*

U.S. Cl. 123—339 **9 Claims**



1. A carburetor for an internal combustion engine of an automobile the carburetor comprising:

air suction passage means having a Venturi means therein;

throttle valve means disposed in said air suction passage means downstream of said Venturi means;

bypass passage means for bypassing said air suction passage means, said bypass passage means communicating at one end with said air suction passage means upstream of said throttle valve means and at the other end with said air suction passage means downstream of said throttle valve means;

fuel passage means for fluidly connecting a portion of said bypass passage means with a fuel source;

solenoid valve means disposed on a fuel-air mixture passage means of said bypass passage means downstream of a junction between said bypass passage means and said fuel passage means for controlling an opening of said bypass

passage means in accordance with an electric load increase on the engine, so that a quantity of fuel-air mixture suitable for compensation of the idling rotational speed of the engine is supplied into said air suction passage means; and

a control circuit means for detecting the electric load increase due to use of electric means installed in the automobile and for transmitting electric signals to said solenoid valve means.

4,426,969

OVERSPEED SAFETY MEANS FOR FUEL INJECTION PUMPS OF INTERNAL COMBUSTION ENGINES

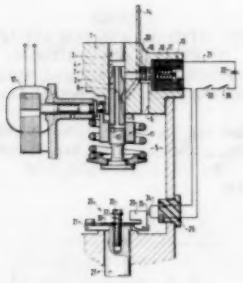
Franz Eheim, Stuttgart, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed May 20, 1982, Ser. No. 380,377

Claims priority, application Fed. Rep. of Germany, Jun. 4, 1981, 3122250

Int. Cl.³ F02D *5/00*

U.S. Cl. 123—357 **4 Claims**



1. An overspeed safety apparatus for a fuel injection pump provided on an internal combustion engine, said injection pump having a work chamber and a suction chamber, said work chamber communicating with said suction chamber via an electrically activated valve, said electrically activated valve being operated by an electrical circuit and normally being held in an open position during operation of said engine, said pump further having means for ascertaining a threshold rpm for fuel shut-off and thereupon permanently interrupting the electrical circuit to close the electrically activated valve, characterized in that said means for ascertaining the threshold rpm comprises a centrifugal, electrical conductor, interruptor means provided with a flyweight, said flyweight pivoting counter to means providing a restoring force in proportion to increasing rpm in response to centrifugal force, said electrical circuit having an electrical conductor loop means positioned adjacent to said centrifugal, electrical conductor, interruptor means, said electrical conductor loop means being severed by said flyweight upon said centrifugal electrical conductor, interruptor means attaining the threshold rpm, thereby permanently interrupting said electrical circuit thereby closing said electrically activated valve to prevent fuel flow from the suction chamber to the work chamber whereby said electrical conductor loop means must be replaced in order to complete the electrical circuit to said electrically activated valve.

4,426,970

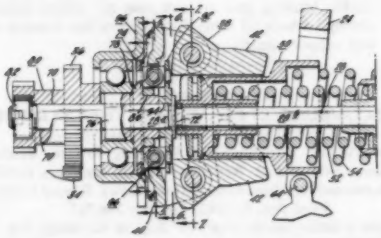
RESILIENT DRIVE FOR FUEL INJECTION PUMP GOVERNORS

Leon A. Galis, Ludlow, and Richard J. Czarnik, Easthampton, both of Mass., assignors to Ambac Industries, Inc., Springfield, Mass.

Filed Jan. 12, 1981, Ser. No. 224,001

Int. Cl.³ F02D *31/00*

U.S. Cl. 123—364 **1 Claim**



1. In a fuel injection pump governor for diesel engines comprising a governor shaft, means for rotating said governor shaft at a speed corresponding to engine speed, a flyweight assembly on said governor shaft for sensing the speed of rotation thereof, said flyweight assembly comprising a spider and at least one flyweight pivotally connected to said spider for rotation with respect to said spider in response to speed changes of the shaft, means operatively connected with said flyweight assembly for controlling fuel delivery under predetermined speed conditions as sensed by said flyweight assembly, the improvement comprising means resiliently connecting said flyweight assembly spider with said governor shaft to provide a rotation of said spider assembly at the same rate as said governor shaft while permitting a limited resilient relative rotation of said flyweight assembly with respect to said governor shaft, said latter means comprising a spider adpator disposed adjacent said spider and attached to said shaft on one side of said spider, a spider retainer attached to said shaft adjacent said spider on the opposite side thereof from said spider adaptor, a pair of substantially diametrically opposed slots in said spider, a spring assembly in each said slot, each said spring assembly comprising a first spring seat disposed in said slot and attached at opposite sides thereof to said spider adaptor and said spider retainer, a compression coil spring seated at one end on said first spring seat, a second spring set disposed at one end of said spider slot, said spring being seated at its other end on said second spring seat, and a spring guide extending from said second spring seat and passing through said coil spring into a bore in said first spring seat for sliding movement therewithin upon extension or contraction of said spring, said spring seats and spring guide serving to maintain spring alignment and minimize spring distortion, the springs of said spring assemblies being oppositely disposed so as to resiliently bias said spider toward a normal operating position with espect to said governor shaft intermediate the limit positions of its permissible rotation with respect thereto.

4,426,971

FUEL INJECTION RATE LIMITING DEVICE FOR DIESEL ENGINE

Mitsumasa Isoda, Sakaishi, Japan, assignor to Kubota Ltd., Osaka, Japan

Filed May 28, 1982, Ser. No. 382,815

Claims priority, application Japan, Jun. 29, 1981, 56-96991[U]

Int. Cl.³ F02D *31/00*

U.S. Cl. 123—367 **1 Claim**

1. A fuel injection rate limiting device for a diesel engine, including:

a governor mechanism **13** for controlling the fuel injection rate of a fuel injection pump **12** of a diesel engine **11**;

a limitee means **15** formed as an integral part of a movable control element **14** of the governor mechanism **13**;

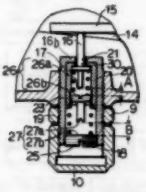
a fixed cylinder means **19** fixedly mounted at a given position with respect to said fuel injection pump **12** and on the fuel injection rate increasing side "r" of said limitee means **15**;

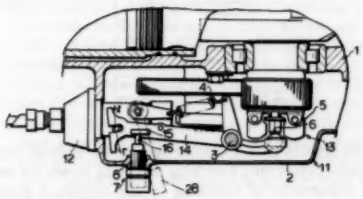
a movable cylinder means **20** set in said fixed cylinder means **19** freely slidable longitudinally fore and back substantially along the direction of movement of said limitee means **15**;

a fuel injection rate limiter means **16** set through through-holes **21** and **30** made in the front end walls of said movable cylinder means **20** and said fixed cylinder means **19** respectively to extend from inside said movable cylinder means **20** freely slidable through said both holes **21** and **30** to project beyond the front end wall of said fixed cylinder means **19** to oppose said limitee means **15**;

a first adjusting screw **23** screwed into the rear end portion of said movable cylinder means **20** with its longitudinal position adjustable;

a first spring means **17** loaded between said first adjusting screw **23** and said limiter means **16** in said movable cylinder means **20** urging said limiter means **16** in the fuel injection rate decreasing direction "l";





a first checking means **26** disposed between said first adjusting screw **23** and limiter means **16** in said movable cylinder means **20** to determine the dimension "A" by which said limiter means **16** can retreat toward said first adjusting screw **23** in said fuel injection rate increasing direction "r";

a second adjusting screw **25** screwed into the rear end portion of said fixed cylinder means **19** with its longitudinal position adjustable;

a second spring means **18** loaded between said second adjusting screw **25** and said movable cylinder means **20** in said fixed cylinder means **19** urging said movable cylinder means **20** forward;

a second checking means **27** disposed between said second adjusting screw **25** and said first adjusting screw **23** in said fixed cylinder means **19** to determine the dimension "B" by which said movable cylinder means **20** can retreat toward said second adjusting screw **25** in said fuel injection rate increasing direction "r"; and

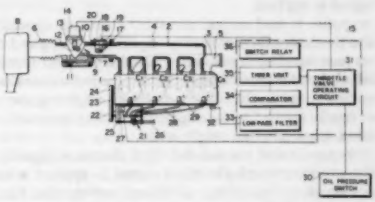
an arrangement wherein the tension of either of said first spring means **17** and said second spring means **18** is set lower than the force with which said movable control element **14** of said governor mechanism **13** is shifted in said fuel injection rate increasing direction "r" to be used as torque spring, while the other spring means is set at a higher tension to be used as starting spring.

4,426,972

VIBRATION SUPPRESSION SYSTEM FOR DIESEL ENGINE

Akira Kimura, Zushi, and Toshiro Abe, Yokohama, both of Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Mar. 22, 1983, Ser. No. 477,602
Claims priority, application Japan, Mar. 26, 1982, 57-48388
Int. Cl.³ F02D *1/04*
U.S. Cl. 123—378 **12 Claims**



1. A system for suppressing vibration of a diesel engine, comprising:

means for decreasing the amount of intake air to be inducted into the engine when operated;

means for heating the intake air when operated;

first detecting means for detecting a low engine speed and low engine load operating range of the engine, and for producing a first signal in response thereto;

second detecting means for detecting the level of vibrational acceleration of engine vibration having frequencies within a predetermined range, and for producing a second signal in response thereto;

first control means for operating said intake air amount decreasing means in response to said first signal from said detecting means; and

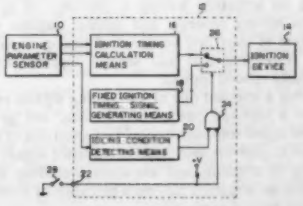
second control means for operating said heating means in response to said second signal from said second detecting means.

4,426,973

METHOD OF AND APPARATUS FOR CONTROLLING THE IGNITION TIMING OF AN INTERNAL COMBUSTION ENGINE

Jiro Nakano; Hideo Miyagi, both of Okazaki, and Hironobu Ono, Toyota, all of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed Sep. 18, 1981, Ser. No. 303,494
Claims priority, application Japan, Sep. 25, 1980, 55-132272
Int. Cl.³ F02P *5/04*
U.S. Cl. 123—418 **18 Claims**



1. A method of controlling the ignition timing of an internal combustion engine having a predetermined input terminal for

servicing the ignition timing, said method comprising the steps of:

detecting the operating condition of the engine and producing at least one first electrical signal which indicates the detected operating condition;

calculating, in response to the produced first electrical signal, a spark advance angle which corresponds to an optimum ignition timing at the detected operating condition;

detecting whether or not the engine is in the idling condition, to produce a second electrical signal when the engine is in the idling condition;

detecting whether or not a predetermined electrical signal is applied to said service input terminal and producing a third electrical signal when said predetermined electrical signal is applied;

in response to said second and third electrical signals, when the predetermined electrical signal is not applied to said service input terminal and when the predetermined electrical signal is applied to said service input terminal but the engine is not in the idling condition, adjusting the timing of sparks applied to the engine depending upon said calculated spark advance angle; and

in response to said second and third electrical signals, when the predetermined electrical signal is applied when the engine is in the idling condition, setting the timing of sparks applied to the engine to a predetermined fixed timing.

4,426,974

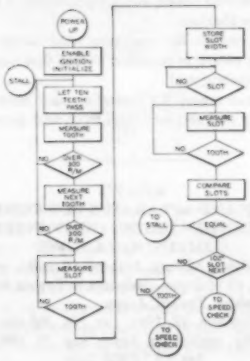
DIGITAL TIMING CIRCUIT FOR A ROTATING MACHINE

Donald R. Nash, Berkey, Ohio, assignor to Allied Corporation, Morristown, N.J.

Filed Mar. 1, 1982, Ser. No. 353,296

Int. Cl.³ F02P *5/04, 9/00*

U.S. Cl. 123—418 **11 Claims**



1. A method of producing an ignition advance signal, including the steps of:

rotating an armature having a plurality of spaced-apart indicia having separate and distinct angular spacing to generate at least first and second timing signals, from at least respective first and second separate and distinct angularly spaced indicia;

identifying a selected one of said timing signals corresponding to a selected one of said indicia, and generating a trigger signal responsive to said selected one of said timing signals to provide said ignition advance signal;

said step of rotating said armature including the step of rotating an armature having a plurality of teeth and slots defined by said teeth; and

said step of generating said trigger signal includes the step of sensing the passage of a first one of said slots past a defined angular position and the subsequent step of measuring the time required for a second one of said slots to pass said defined angular position to define the order of each slot passing said angular position and the order of each said timing signal.

4,426,975

IGNITION TIMING CONTROL SYSTEM FOR INTERNAL COMBUSTION ENGINES

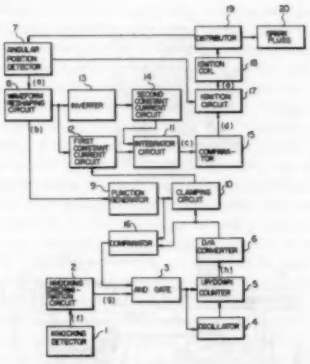
Shosuke Suzuki; Teruyoshi Ito, both of Kariya; Yukio Sakakibara, Aichi; Takashi Yamada, Nishio; Fumiyoshi Kubo, Kawasaki; Kunimasa Yoshimura, Mishima; Mitsuyuki Ugajin, Toyota; Kiyokane Kaji, Toyota, and Mitsuyuki Banno, Toyota, all of Japan, assignors to Nippondenso Co., Ltd., Kariya and Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, both of Japan

Filed Nov. 18, 1981, Ser. No. 322,693

Claims priority, application Japan, Nov. 26, 1980, 55-169115[U]

Int. Cl.³ F02P *5/14*

U.S. Cl. 123—425 **4 Claims**



1. In an ignition timing control system, for internal combustion engines comprising knocking detecting means for detecting the occurrence of knocking in said engine, a knocking discrimination circuit responsive to an output signal of said knocking detecting means to determine the occurrence of knocking and generate a rectangular pulse in response to each knocking event, an ignition timing control circuit responsive to the occurrence of said knocking to adjust a basic ignition timing established in accordance with an operating condition of said engine, and ignition means responsive to an output signal of said ignition timing control circuit to effect ignition of said engine, the improvement wherein said ignition timing control circuit comprises:

speed sensor means for detecting a speed of said engine, and generating an engine speed signal,

a pair of constant current circuits operated by a signal from said speed sensor means,

an integrator circuit whose charge and discharge are controlled by said pair of constant current circuits,

means for outputting a voltage corresponding to the output signal of said knocking detecting means, said outputting means controlling the output current of one of said constant current circuits according to the knocking state, and

means for limiting the output current of one of said constant current circuits by limiting the output voltage of said outputting means according to a signal from said speed sensor means.

4,426,976

ENGINE AIR/FUEL RATIO CONTROL SYSTEM INJECTING BLEED AIR INTO BOTH FUEL SYSTEMS OF DOUBLE BARRELED CARBURETOR

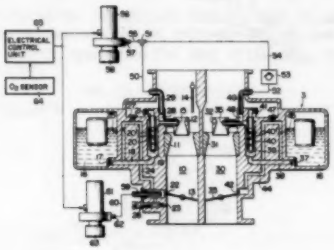
Toshio Tanahashi; Hidemi Ohnaka, and Yasuo Ohmori, all of Susono, Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed Nov. 27, 1981, Ser. No. 325,198

Claims priority, application Japan, Dec. 11, 1980, 55-178499[U]

Int. Cl.³ F02M 7/18

U.S. Cl. 123—440 **4 Claims**



1. An air/fuel ratio control system for an internal combustion engine having,

(a) an exhaust system through which exhaust gases are vented; and

(b) a carburetor having,

(b1) a primary fuel supply system comprising a primary intake passage and a primary throttle valve which controls the air flow resistance of said primary intake passage;

(b2) a secondary fuel supply system comprising a secondary intake passage and a secondary throttle valve which controls the air flow resistance of said secondary intake passage, so as to keep said secondary intake passage closed when said primary throttle valve is opened to less than a certain predetermined opening amount, and so as progressively to open said secondary intake passage as said primary throttle valve is opened beyond said predetermined amount, if and only if the intake air flow through said carburetor is greater than a certain predetermined amount;

(b3) a primary main fuel supply nozzle opening into said primary intake passage, fuel being supplied to said primary main fuel supply nozzle so as to be sucked therefrom into said primary intake passage by the depression in said primary intake passage, when air is flowing through said primary intake passage; and

(b4) a secondary main fuel supply nozzle opening into said secondary intake passage, fuel being supplied to said secondary main fuel supply nozzle so as to be sucked therefrom into said secondary intake passage by the depression in said secondary intake passage, when air is flowing through said secondary intake passage;

said air/fuel ratio control system, comprising:

(c) a sensor, mounted to said exhaust system, which detects the concentration of a component in the exhaust gases in said exhaust system, and which produces a sensor electrical signal representative thereof;

(d) an electrical control unit, which receives said sensor electrical signal from said sensor, and which produces a valve control electrical signal based thereon;

(e) an air bleed control valve which receives said valve control electrical signal from said electrical control unit, comprising:

(e1) an air inlet open to air at substantially atmospheric pressure, and

(e2) an air outlet;

(e3) said air bleed control valve varying its resistance to flow of air from said air inlet to said air outlet, according to said valve control electrical signal;

(f) a primary air bleed path system, leading from said air outlet of said air bleed control valve, which supplies primary bleed air into the fuel which is being supplied through said primary main fuel supply nozzle into said primary intake passage;

(g) a secondary air bleed path system, leading from said air outlet of said air bleed control valve, which supplies secondary bleed air into the fuel which is being supplied through said secondary main fuel supply nozzle into said secondary intake passage;

and

(h) a one-way air valve, comprising an inlet and an outlet, fitted in said secondary air bleed path system so as to allow air flow in said secondary air bleed path only in the direction from said air outlet of said air bleed control valve towards said secondary main fuel supply nozzle wherein the operational relation between said sensor, said electrical control unit, and said air bleed control valve is to control the sum of supply of said primary bleed air and said secondary bleed air so as to keep the air/fuel ratio of the air-fuel mixture supplied to said internal combustion engine by said carburetor substantially in a small range about the stoichiometric ratio.

4,426,977

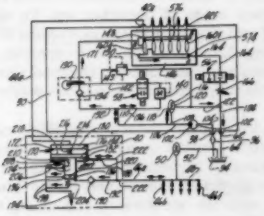
DUAL SOLENOID DISTRIBUTOR PUMP SYSTEM

Lael B. Taplin, Union Lake; Richard P. Walter, Southfield; Charles R. Kelso, and Albert E. Sisson, both of Farmington, all of Mich., assignors to The Bendix Corporation, Southfield, Mich.

Filed Dec. 17, 1980, Ser. No. 217,297

Int. Cl.³ F02M 41/02, 51/00

U.S. Cl. 123—446 **14 Claims**



1. A fuel injection system for a diesel engine having injection and metering modes of operation for delivering fuel from a fuel reservoir to the cylinders of an engine comprising:

a plurality of fuel injectors wherein each of said fuel injectors comprises:

a housing having a first port adapted to receive fuel at a first determinable pressure level, a second port adapted to receive fuel at a second determinable pressure level and a nozzle, and further having metering chamber means connected to said second port, for storing a premetered quantity of fuel, during the metering mode of operation, prior to the injection of said premetered quantity of fuel into the engine during the injection mode of operation;

piston means responsive to the differential fuel pressure applied thereacross having a first pressure receiving surface in fluid communication with said first port and a second pressure receiving surface in fluid communication with said second port for reciprocatively moving within said housing or selectively compressing and for causing said premetered quantity of fuel to exit said metering chamber means and to be injected into said engine, through said nozzle, during the injection mode and for

selectively permitting fuel to reenter said metering chamber means during a subsequent metering mode;

manifold means for connecting in fluid communication each of second ports of each of said fuel injector;

pressure regulating means connected between said manifold means and the fuel reservoir for regulating and for supplying fuel at said second determinable pressure to said second inlet port of each of said injectors and for returning to the reservoir excess fuel received from said injectors;

distributor pump means connected to the said first port of each of said fuel injectors and to the fuel reservoir for sequentially lowering said first pressure level to a pressure lower than that of the pressure established by said pressure regulating means thereby causing said piston to move causing said premetered quantity of fuel to enter said metering chamber of a particular one of said injectors through said second port and for sequentially thereafter increasing said first pressure level thereby causing said piston to pressurize the fuel within said metering chamber to initiate fuel injection into the engine through said nozzle;

a laminar flow restrictor means for creating a linear relationship between the velocity of fuel flow and the pressure differential thereacross situated upstream of said metering chamber and wherein said distributor pump means, includes a plurality of output ports wherein each output is connected to a particular one of said first ports of each said fuel injector via a bidirectional injection line and further having a pump inlet port adapted to receive fuel from the fuel reservoir and an outlet port adapted to return fluid to the reservoir, for selectively lowering said first pressure level applied to each said fuel injector in timed relation to the combustion process within the engine and thereafter for selectively increasing said first pressure level, comprising:

first pressure source means for supplying pressurized fluid, a determinable first pressure level;

timing valve means for directing the output of said first pressure source means to a distributor valve means during the injection mode of operation and for directing the output of said first pressure source means to said return port during the metering mode of operation, said timing valve means adapted to receive electrical signals in timed relationship to the combustion process within the engine; and

distribution valve means for receiving fluid under pressure from said first pressure source means including first distribution means for sequentially connecting the pressurized fluid to a particular one of said output ports in timed sequence with the operation of said timing valve means and with the combustion process within the engine, said distributor valve means further including second distribution means for sequentially connecting each one of said output ports to said return port for a determinable length of time prior to the time said particular one of said output ports is connected to said first pressure source means and wherein said return port is maintained at a pressure less than the pressure of said first pressure source means.

4,426,978

FUEL SUPPLY CONTROL SYSTEM FOR AN INTERNAL COMBUSTION ENGINE

Michiaki Sasaki, Yokohama; Kiyokazu Yamamoto, and Ko Hiratsuka, both of Fujisawa, all of Japan, assignors to Nissan Motor Company, Limited and Jidosha Denki Kogyo Kabushiki Kaisha, both of Kanagawa, Japan

Filed Jan. 30, 1981, Ser. No. 230,287

Claims priority, application Japan, Jan. 31, 1980, 55-10576; Jan. 31, 1980, 55-10577

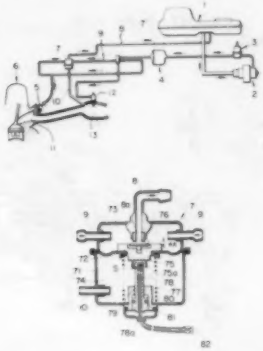
Int. Cl.[3] **F02M** *39/00*

U.S. Cl. 123—458 **21 Claims**

1. A fuel supply control system for an internal combustion engine of the type wherein excess fuel supplied to the engine is returned from the engine to a fuel supply source for the engine, comprising:

(a) a pump for circulating fuel between the fuel supply source and said engine; and

(b) control means responsive to the rate of flow of the fuel from the engine to said fuel supply source for controlling said pump in such a manner that a minimal amount of fuel beyond that required by said engine is supplied by said



pump to said engine, said control means including a transistor and a sensor for sensing the rate of flow of the fuel from said engine to produce a signal representing the rate of flow of the fuel returned, said signal being coupled to a control electrode of said transistor, said pump including a motor connected in the emitter collector path of said transistor, the magnitude of said signal decreasing as the rate of flow of fuel increases, thereby decreasing the torque for said motor.

4,426,979

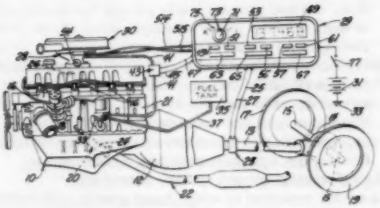
ELECTRICAL CIRCUIT MEANS FOR MANUALLY ADJUSTABLE APPARATUS AND SYSTEM FOR SELECTIVELY CONTROLLING THE AIR-FUEL RATIO SUPPLIED TO A COMBUSTION ENGINE

Wayne Y. Tung, Detroit, Mich., assignor to Colt Industries Operating Corp., New York, N.Y.

Filed Mar. 23, 1981, Ser. No. 246,896

Int. Cl.[3] **F02D** *37/02;* **F02B** *3/00*

U.S. Cl. 123—478 **18 Claims**



1. Electrical circuit means for a fuel metering apparatus for a combustion engine which produces output power as a consequence of combustion air and fuel being supplied thereto wherein said fuel metering apparatus comprises fuel metering means effective for metering fuel to said engine, and wherein said fuel metering means comprises electrically operated valving means, said electrical circuit means comprising first circuit means for electrically interconnecting said electrically operated valving means to a source of electrical potential, and second circuit means, said second circuit means being manu-

ally controllable to thereby vary the electrical energization of said electrically operated valving means in order to cause said valving means to meter fuel to said engine in correspondingly varying rates of fuel flow based on the rate of air flow to said engine.

4,426,980

CORRECTION DEVICE FOR A FUEL METERING SYSTEM IN AN INTERNAL COMBUSTION ENGINE

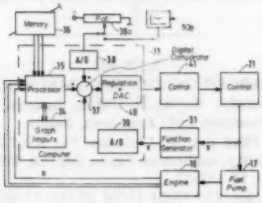
Hermann Eisele, Vaihingen; Gerhard Stumpp, Stuttgart; Wolf Wessel, Oberriexingen; Ulrich Flaig, Markgröningen, and Fridolin Piwonka, Tamm., all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Continuation of Ser. No. 247,025, Mar. 24, 1981, abandoned. This application Mar. 28, 1983, Ser. No. 479,769

Claims priority, application Fed. Rep. of Germany, Mar. 26, 1980, 3011595

Int. Cl.³ F02D *11/16*

U.S. Cl. 123—478 **7 Claims**



1. A drift-compensation correction device for controlling a fuel metering system having a fuel pump in an internal combustion engine in which there is an incorrect relationship between a fuel metering signal and metered fuel quantity due to fuel pump aging, comprising:

means for generating set-point data signals responsive to operating parameters of said engine, said data signals including a drift signal corresponding to said incorrect relationship,

means responsive to a final control element in said fuel metering system for generating actual data signals,

a comparator means for comparing said actual and set-point signals,

a regulating means responsive to said comparator means for providing said fuel metering signal to said final control element via an output circuit means for determing said quantity of fuel to be metered to said pump, and

means supplying a correction intervention signal to said fuel metering signal corresponding to said drift signal, whereby the effect of drift in said set-point generating means due to aging of said pump is compensated for and said set-point generating means is restored to its original output rating value.

4,426,981

APPARATUS FOR DETECTING THE FUEL QUANTITY DELIVERED TO THE COMBUSTION CHAMBERS OF A DIESEL ENGINE

Max Greiner, Gerlingen; Helmut Laufer, and Max Straubel, both of Stuttgart, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Aug. 21, 1981, Ser. No. 295,172

Claims priority, application Fed. Rep. of Germany, May 9, 1981, 3118425

Int. Cl.³ F02M *65/00*

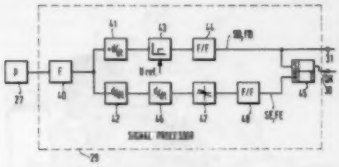
U.S. Cl. 123—488 **11 Claims**

1. An apparatus for detecting the fuel quantity delivered to the combustion chambers of a Diesel engine comprising:

a fuel pressure sensor for producing a pressure signal,

a circuit processing means connected to said sensor for recognizing an onset control function and end of control function of one control procedure, said means including,

first differentiating means responsive to said pressure signal and producing a threshold value signal of a first derivation serving as said onset of said control procedure, and a



second differentiating means for twice differentiating said pressure signal serving as said end of said control procedure, and

a time duration-detection means connected to said first and second differentiating means for detecting fuel quantity as the duration of time elapsing between said onset and said end of said control procedure.

4,426,982

PROCESS FOR CONTROLLING THE BEGINNING OF DELIVERY OF A FUEL INJECTION PUMP AND DEVICE FOR PERFORMING SAID PROCESS

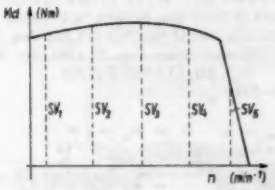
Gerhard Lehner, and Theodor Stipek, both of Hallein, Austria, assignors to Friedmann & Maier Aktiengesellschaft, Hallein, Austria

Filed Oct. 2, 1981, Ser. No. 307,939

Claims priority, application Austria, Oct. 8, 1980, 4999/80

Int. Cl.³ F02M *59/20*

U.S. Cl. 123—501 **7 Claims**



1. A method for controlling the beginning of supply by a fuel injection pump according to the torque and speed of a turbocharged internal combustion engine, said turbocharger being provided with an exhaust valve to release air in excess of a predetermined intake boost pressure, the torque being determined from the intake boost pressure generated by the turbocharger and the amount of air released from said exhaust valve.

4,426,983

LIQUID FUEL PUMPING APPARATUS

Alec H. Seilly, North Wembley, and Andrew E. Murray, London, both of England, assignors to Lucas Industries Limited, Birmingham, England

Filed Sep. 23, 1981, Ser. No. 304,932

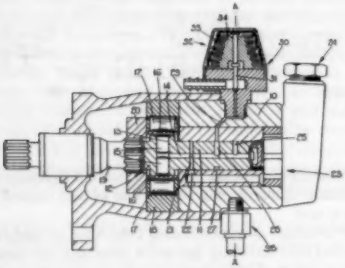
Claims priority, application United Kingdom, Oct. 4, 1980, 8032064; Dec. 23, 1980, 8041280; Mar. 28, 1981, 8109788

Int. Cl.³ F02M *39/00*

U.S. Cl. 123—506 **5 Claims**

1. A liquid fuel injection pumping apparatus for supplying fuel to the injection nozzles in turn of a multi-cylinder compression ignition engine, comprising a plurality of outlets for

connection in use to the fuel injection nozzles respectively, means for delivery of fuel to the outlets in turn, a spill passage which in use is connected to the outlets in turn when said outlets are supplied with fuel, an electrically controlled valve in said spill passage, said valve when open diverting fuel from the outlet with which it is connected, electrical circuit means for controlling the operation of said valve, a pressure transducer responsive to the pressure upstream of said valve, said pressure transducer supplying signals to said circuit means



indicative of the fuel pressures attained during delivery of fuel through the outlets, said circuit means including means responsive to said signals for adjusting the periods during which the valve is closed and having a microprocessor which selects from said signals the one representative of the outlet at which the lower or lowest rate of pressure rise is achieved, and compares said one signal with the remaining signals to produce correction signals which are utilized to prolong the closure of the valve and to extend the time fuel is supplied by the apparatus to those outlets with which the other signals pertain.

4,426,984

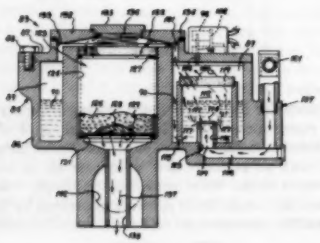
APPARATUS FOR ENTRAINING GASOLINE IN AIR FOR USE IN AN INTERNAL COMBUSTION ENGINE

Jack J. Gilbert, 3 River Rd., Suffern, N.Y. 10901

Continuation-in-part of Ser. No. 112,242, Jan. 14, 1980, abandoned. This application Aug. 27, 1981, Ser. No. 296,659

Int. Cl.³ F02M *21/04*

U.S. Cl. 123—522 **7 Claims**



1. A device for gasifying liquid gasoline comprising, in combination, a substantially closed container, a filter, a desiccant in said filter for demoisturizing incoming air, means attached to the container for supporting the filter, a reservoir of liquid gasoline in said container, means for maintaining a fluid level of said liquid gasoline at about 50% of the total volume of the container, means for jetting the demoisturized air through the liquid gasoline in said reservoir to create an expanded volatile fluid above the reservoir, the expanded volatile fluid including a gas and liquid gasoline, means for breaking down the gas into finer gas particles, and means for stabilizing the gas particles to produce an aeriform gas for use in internal combustion engines, wherein said means for jetting the demoisturized air through the liquid gasoline include tubular means connected to said filter for supplying said demoisturized air, a vaporizing cell disposed in said reservoir and an evaporator disposed in said vaporizing cell, said evaporator including a hollow member with an open base seated on said container and connected to the tubular means for supplying the demoisturized air, said evaporator having a closed top and a wall having upwardly inclined slits for jetting the demoisturized air into the vaporizing cell for production of the expanded volatile fluid, said vaporizing cell including a second hollow member enclosing said evaporator with an open base seated on said container and having an opening in a side wall thereof for entrance of the liquid gasoline therein, and said means for breaking down the gas into finer particles including a solid porous top cover of about 120 microns forming the top of said second hollow member, and wherein said stabilizing means include an open ended cylinder formed within said container, a solid porous top cover of about 90 microns for said cylinder, activated charcoal within said cylinder and screening means at the bottom of said cylinder, whereby the gas particles pass through the porous top cover, enter the cylinder, pass through the activated charcoal and leave the cylinder through the screening means.

4,426,985

SUPERCHARGED INTERNAL COMBUSTION ENGINE

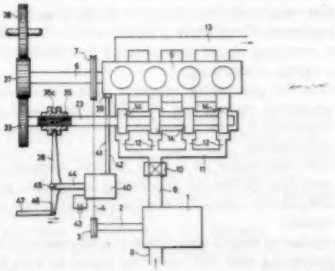
Hiroshi Kanesaka, Kawasaki, Japan, assignor to Kanesaka Technical Institute Ltd., Kanagawa, Japan

Filed Sep. 25, 1981, Ser. No. 305,722

Claims priority, application Japan, Sep. 26, 1980, 55-132976; Sep. 26, 1980, 55-132977

Int. Cl.³ F02B *33/34, 33/42, 37/00*

U.S. Cl. 123—564 **6 Claims**



1. A supercharged internal combustion engine comprising a crankshaft, a piston, an associated cylinder, a combustion chamber defined by said piston and cylinder, a passage communicated with said combustion chamber, an intake port between said passage and said combustion chamber, an exhaust port in said combustion chamber, an intake valve periodically opening and closing said intake port, an exhaust valve periodically opening and closing said exhaust port, supercharging means for supplying air or an air/fuel mixture to said combustion chamber through said passage, rotary valve means disposed in said passage upstream of said intake port, said rotary valve means including a rotary valve operable to periodically open and close to control delivery of air or an air/fuel mixture to said combustion chamber, said rotary valve being open during approximately 180° of the crank angle of said crankshaft, control means for controlling the opening and closing timing of said rotary valve, actuating means for actuating said control means, and engine knock sensing means co-acting with said actuator means, whereby when engine knock is sensed by said engine knock sensing means, said actuating means operates to advance the cut-off timing of the rotary valve to stop the supply of air or air/fuel mixture to said combustion chamber

for a predetermined period, starting prior to the completion of the intake stroke of said piston.

4,426,986

APPARATUS FOR CONTROLLING THE EXHAUST GAS RECIRCULATION RATE IN AN INTERNAL COMBUSTION ENGINE

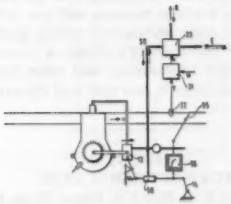
Klaus Müller, Tamm; Helmut Maurer, Schwieberdingen; Franz Rieger, Aalen, and Ernst Linder, Mühlacker, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Division of Ser. No. 127,158, Mar. 4, 1980, Pat. No. 4,333,439. This application Mar. 16, 1982, Ser. No. 358,760

Claims priority, application Fed. Rep. of Germany, Mar. 22, 1979, 2911209

Int. Cl.³ F02M *25/06*

U.S. Cl. 123—57 **1 Claim**



1. A system for controlling exhaust gas in an exhaust tube of an internal combustion engine comprising:

an air intake tube connected to said engine,

an exhaust tube connected to said engine,

an accelerator pedal,

a fuel injection system controlled by at least said accelerator pedal and rpm of the engine,

an exhaust throttle valve disposed in said exhaust tube,

a relative positioner related to said accelerator pedal and said fuel injection system for varying the quantity of fuel injected into said engine,

an exhaust gas sensor in combination with a control element and control apparatus for influencing the position of said relative positioner, and

a curve follower generator for influencing a position of said exhaust throttle valve in said exhaust tube in accordance with the position of said accelerator pedal,

whereby exhaust gases are built up in said exhaust tube in the direction of said engine depending on the position of said exhaust throttle valve relative to an axis of said exhaust tube.

4,426,987

METHOD AND APPARATUS FOR CONTROLLING THE COMPOSITION OF THE COMBUSTIBLE MIXTURE OF AN ENGINE

Reinhard Latsch, Vaihingen, and Valerio Bianchi, Hochdorf, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Continuation of Ser. No. 747,676, Dec. 6, 1976, Pat. No. 4,372,270. This application Sep. 21, 1982, Ser. No. 420,973

Claims priority, application Fed. Rep. of Germany, Dec. 6, 1975, 2554988

Int. Cl.³ F02B *3/00*

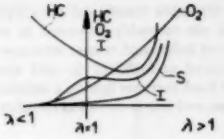
U.S. Cl. 123—571 **9 Claims**

1. A method for controlling the exhaust gas of an internal combustion engine, said engine including combustion chambers, inlet conduits leading to said combustion chambers and exhaust conduits leading from said combustion chambers to the atmosphere, comprising the steps of

placing an ion-current sensor in the exhaust conduit for measuring ion-currents;

generating a nominal value of the ion-currents;

periodically integrating the measured values of the ion-current, especially during one working cycle of a piston of the engine, and



comparing said integrated ion-currents with one another, thereby deriving a signal representing a difference value and comparing said difference values with said nominal value, and

altering the exhaust gas recycling rate in dependence on the result of said comparison.

4,426,988

CONTROL ELEMENT

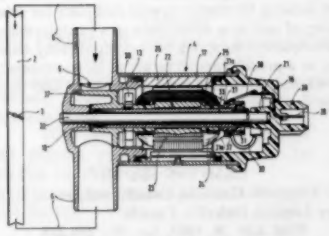
Max Greiner, Gerlingen; Gerold Grimm, and Heinrich Knapp, both of Leonberg, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Aug. 25, 1982, Ser. No. 411,229

Claims priority, application Fed. Rep. of Germany, Jan. 5, 1982, 3200096

Int. Cl.³ F02M *23/04*

U.S. Cl. 123—585 **4 Claims**



1. A control device including an electric servo motor controlled by a current supply, said control device further including a throttle device which opens, to a greater or lesser degree a passage diameter of a by-pass flow line around a throttle valve disposed in an intake line of an internal combustion engine, wherein said control device has at least one elastic element secured thereto by means of which, during an interruption of said current supply of said electric servo motor, said throttle device can be moved by said at least one elastic element into a defined position thereby opening said passage diameter of said flow line.

4,426,989

BOW STRING RELEASE

Richard M. Sutton, Fridley, Minn., assignor to Sutton and Thayer, Fairmont, Minn., part interest to each

Filed Apr. 1, 1981, Ser. No. 249,750

Int. Cl.³ F41B *5/00*

U.S. Cl. 124—35 A **5 Claims**

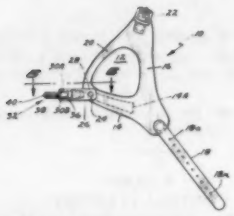
1. Bow string release for use by an archer with a bow including a bow string stretched between tips of said bow for shooting an arrow, said bow string release comprising:

a. strap including a hand strap, a front wrist strap, a rear

wrist strap with a plurality of holes, a cross strap between said front and said hand strap, a roller clasp secured to said front wrist strap for securing said rear wrist strap;

b. a pivot pin, a steel plate being secured by said pivot pin at a front portion of said hand strap permitting a first degree of freedom, said steel plate being doubled over and including two opposing and aligned pivot holes permitting a second degree of freedom;

c. a release structure positioned on a cylindrical pin, said cylindrical pin rotatably mounted in said opposing and aligned pivot holes, said release structure including a press sleeve secured and affixed to said cylindrical pin and securing a hook member having a substantially right-angle hook at one end and a threaded member at the other end



screwed through said press sleeve and an eyed closed-loop string extending beyond said hook; and,

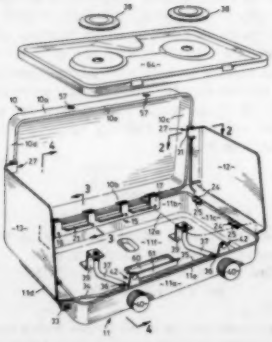
d. a thumb plate including a thumb pad screwed onto an overlapping end of said threaded hook member, said hook member protruding beyond said press sleeve permitting said eyed-string loop to extend around a bow string and over said hook member for pulling of a bow string, said hook member being maintained in position by an archer's thumb holding his thumb against said plate for subsequent drawing of said bow string back to a predetermined point for subsequent release of a bow string thereby shooting an arrow to a predetermined target at an accelerated departure velocity from said hook member of said bow string release.

4,426,990

CAMPING STOVE

Charles G. Shepherd, Oakville, Canada, assignor to B. D. Wait Company Limited, Oakville, Canada

Filed Apr. 28, 1981, Ser. No. 258,338
Claims priority, application Canada, Apr. 1, 1981, 374413
Int. Cl.³ F24C *1/16*; B65D *51/04*
U.S. Cl. 126—9 B **5 Claims**



1. A portable stove, comprising:

a housing made of sheet metal;

said housing comprising a first housing portion forming a lid and a second housing portion forming a base; and

burner means in said base for heating food;

said lid and said base each being dish-shaped and having a front wall, a rear wall and opposed side walls depending from a generally planar panel,

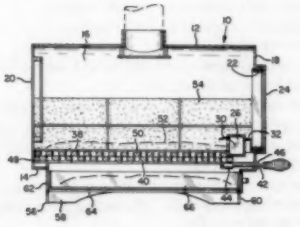
said lid and said base being formed from similar workpieces with said front, rear and side walls of said lid having the same length and dimensions and at least substantially the same height dimensions as the corresponding walls of said base said lid having portions each being formed with a peripheral curled rim extending along said front, rear and side walls thereof and a pivotal connection between said rear walls of said portions allowing pivotation of said lid relative to said base between a closed position in which said rim of said lid is adjacent said rim of said base and an open position in which said lid is upstanding from said rear wall of said base, said pivotal connection being formed by sheet metal projections extending from the interior of one of said housing portions between said rim portions to the exterior of said other portion and curling around said rim of the other of said housing portions in pivotally slidable surface-to-surface relationship, said other housing being formed with openings in said rear wall thereof for receiving said projections.

4,426,991

STOVE CONSTRUCTION

Robert L. Stevenson, P.O. Box 370, Rogue River, Oreg. 97537

Filed Nov. 13, 1981, Ser. No. 321,095
Int. Cl.³ F24C *1/14*
U.S. Cl. 126—77 **1 Claim**



1. A stove construction comprising

a firebox having top, bottom, side, front and rear wall portions,

an opening in said bottom wall extending longitudinally in the direction of front to rear,

longitudinal support means extending along opposite sides of said opening,

a first grate supported on said longitudinal support means for slidable movement,

a second grate supported on said first grate,

a tubular housing leading inwardly into said firebox from one side and at the front,

said housing having an outer draft inlet end and an inner draft opening facing rearwardly in a plane immediately above the said second grate,

said second grate being confined against longitudinal movement between said tubular housing and the rear wall of the firebox,

each of said grates having a plurality of spaced cross bars forming openings between said bars,

said cross bars and openings on both grates having the same longitudinal dimension whereby upon offsetting the cross bars of the two grates longitudinally, an imperforate floor is provided and upon aligning the cross bars longitudinally, holes are provided in the floor,

projection means on the rear wall of said firebox located for

rear abutment by said first grate for positioning the latter in its rearward position in said offsetting relation of its cross bars with the cross bars of said second grate,

said first grate being slidable longitudinally relative to said second grate whereby upon reciprocation of said first grate, ashes are caused to be sifted through said grates,

said slidable grate terminating short of said front wall to allow reciprocation of said slidable grate for shaking ashes down through said opening.

4,426,992

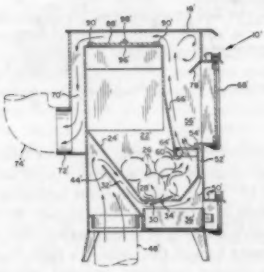
FREE STANDING STOVE

Donald S. Martenson, 24430 S. Highway 99E, Canby, Oreg. 97013

Division of Ser. No. 165,046, Jul. 1, 1980, Pat. No. 4,359,040. This application May 28, 1982, Ser. No. 383,255

Int. Cl.³ F24C *1/14*

U.S. Cl. 126—77 **2 Claims**



1. A free standing stove comprising:

a firebox for initiating the combustion of fuel, said firebox including a bottom with a draft inlet therein;

a first conduit for conveying air to said draft inlet;

a draft inlet damper disposed in said draft inlet for controlling the flow of the air from said first conduit into the bottom of said firebox and for permitting combustion by-products to drop downwardly through said draft inlet damper and out of said firebox;

a secondary combustion chamber for continuing the combustion, said secondary combustion chamber receiving the gasses of combustion from said firebox and further oxidizing the gasses, said secondary combustion chamber including a lower portion;

a second conduit for conveying air into said lower portion of said secondary combustion chamber, said second conduit receiving air from said first conduit; and

a third conduit for conveying the gasses of combustion from said secondary combustion chamber.

4,426,993

VALVE FOR APPLIANCE COMBUSTION AIR INLET

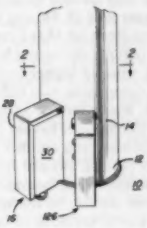
Clifford L. Hoyme, P.O. Box 1485, Camrose, Alberta, Canada T4V 1X3

Filed Jan. 15, 1981, Ser. No. 225,729

Int. Cl.³ F24C *3/00*

U.S. Cl. 126—85 B **8 Claims**

1. In combination, an interior building area in which at least one heat of combustion powered appliance is disposed, a combustion air inlet for said building area including an air supply duct having an outlet end opening into said area, a valve assembly for said outlet end for closing said outlet end during periods of non-operation of said appliance and opening said outlet and during periods of operation of said appliance, said valve assembly including a mount supported adjacent one side of said outlet end and defining a pivot axis disposed transverse to a path extending generally radially outwardly from the center of said outlet end, a damper plate mounted for swinging oscillation about said axis between a closed position extending across and closing said outlet end and an open position inclined relative to and extending outwardly of said outlet end, and a thermostat electrical circuit controllable solenoid operatively connected with said damper plate for applying opening and closing forces upon said damper plate to open and close said damper plate responsive to electrical actuation and deactuation, respectively of said solenoid, said damper plate including means gravity yieldingly biasing said damper plate toward the



closed position thereof, said solenoid being connected to said damper plate by connecting means establishing a lost motion connection therewith wherein full movement of the damper plate to the open position thereof may lag relative to full actuation of said solenoid to open said damper plate, said connecting means including means yieldingly biasing said damper plate toward said open position responsive to full actuation of said solenoid, said connecting means establishing a positive connection between said solenoid and damper plate to positively close the latter responsive to deactuation of said solenoid.

4,426,994

HEATING FIREPLACE AND HEAT EXCHANGER FOR A HEATING FIREPLACE

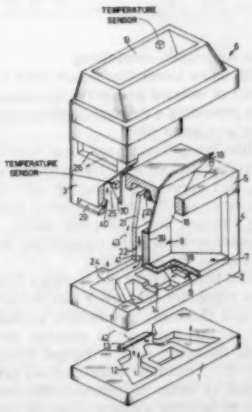
Hans A. Burger, Worb, and Wilhelm Gehrig, Glovelier, both of Switzerland, assignors to Kaminbau Burger's Sohne, Thorishaus, Switzerland

Filed Jun. 25, 1981, Ser. No. 277,075

Claims priority, application Switzerland, Jul. 21, 1980, 5556/80; Feb. 23, 1981, 1178/81

Int. Cl.³ F24B *7/00, 9/04*

U.S. Cl. 126—121 **9 Claims**



1. A fireplace for heating living areas, rooms and the like by

heat radiation of the fire and by a hot air stream and having a heat exchanger for the preparation of hot water, comprising

a fire chamber including a bottom wall (7), a rear wall (8, 16) and lateral walls (30);

an air guide system accommodated in the walls for collecting and heating fresh air (42, 43) from outside the room, said air guide system including a bottom duct (11, 12, 14) formed on at least a part of the lower side of the bottom wall (7) and having an air infeed for receiving fresh air (42) from outside the room and a hot air outfeed (15) connected with the fire chamber;

a downdraft duct (22) formed on at least a part (8) of the outside of said rear wall (8, 16) and having an air infeed (at 23) for receiving fresh air (43) from outside of the room and an outfeed (29) for delivering hot air to the room, said air infeed being situated higher than the air outfeed;

a heat exchanger comprising two hollow partitions (7, 8) to be traversed by water for the preparation of hot water, each of said partitions (7, 8) having one side (38, 39) delimiting said fire chamber and another side (9, 41) delimiting the bottom duct (11, 12, 14) and the downdraft duct (22) respectively, thereby being operative to transfer heat on the one side from the fire to the water and on the other side from the water to the fresh air in said bottom duct (11, 12, 14) and in said downdraft duct (22) respectively;

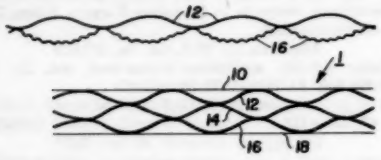
said two hollow partitions (7, 8) of said heat exchanger are mutually adjoining, flat sheet-steel boxes (7, 8) arranged at least approximately at right angles to each other, and the hollow cavities of said boxes, to be traversed by the water, being in communication with each other.

4,426,995

SOLAR QUILT

Gerald E. Wilson, London, Canada, assignor to Carpools Environmental Protection Services Ltd., London, Canada

Continuation-in-part of Ser. No. 964,413, Nov. 28, 1978, abandoned. This application Oct. 14, 1981, Ser. No. 311,202
Claims priority, application Canada, Sep. 1, 1978, 310531
Int. Cl.³ F23J *3/02*
U.S. Cl. 126—426 **6 Claims**



1. A flexible solar quilt, comprising

an upper film and a lower film which have therebetween a multiplicity of isolated gastight compartments, said compartments providing a thermal insulation barrier between said upper and lower films,

said upper film being flexible and clear with a capability of high ultraviolet and infrared transmission in a downward direction, said upper film including reflective means for reflecting downwardly infrared energy impinging on the underside thereof, said reflective means comprising a layer of unidirectional light transmitting material on the lower surface of the upper film;

said lower film being flexible and having a high light energy absorption capability, said lower film including an organic polymer and thermally conductive particles which are dispersed in the polymer to provide the lower film, through its thickness, with a thermal conductivity of at least 10.0×10^{-4} calories/second/square centimeter/(°C./centimeter) in order to promote the transfer of heat toward an underlying medium which is to be heated,

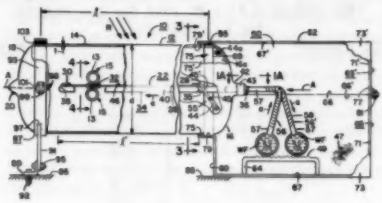
said lower film being formed to provide therein, in the area thereof associated with each of the isolated gastight compartments, a plurality of downwardly extending projections, said lower film having a lower surface with an area which is at least about 30% greater than the area of a plane of commensurate lateral dimensions.

4,426,996

SOLAR COLLECTOR APPARATUS

Dennis J. Ure; Arthur H. Wilder, and Richmond W. Wilson, all of Corning, N.Y., assignors to Corning Glass Works, Corning, N.Y.

Filed Jul. 6, 1981, Ser. No. 280,891
Int. Cl.³ F24J *3/02*
U.S. Cl. 126—443 **25 Claims**



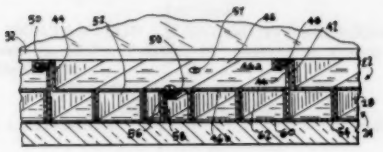
1. A solar collector comprising: a receiver tube formed of a closed glass envelope being evacuated to a partial pressure of about at least 10^{-4} torr., said envelope including a relatively thin wall formed of a relatively long section of large outside diameter cylindrical tubing of at least sixteen feet in length and having a diameter to wall thickness in a ratio of at least 1/50, said envelope further including opposed hemispherical-like inboard and outboard end portions sealed to corresponding end portions of the tubing for closing said envelope, the envelope being substantially transparent and forming a solar window to allow for the passage of solar radiation therethrough; a continuous heat exchange conduit passing through the envelope including a lengthwise straight pipe section having entrant and exit ends, the pipe section bent on itself forming a pair of pipes and U bend therebetween, a major portion of the pipes being located within the envelope in parallel axial relation therewith, the U bend at one free end of the conduit being within said envelope near the outboard end thereof and the entrant and exit ends adjacent each other being at an opposite end of the conduit exterior of the envelope near the inboard end thereof, said envelope being uninterrupted except for the passage of the conduit therethrough, said conduit being hermetically sealed with the envelope to maintain the evacuated condition thereof; an absorber having opposed front and rear sides, a pair of opposed lateral edges and a pair of opposed transverse edges joining said lateral edges, said absorber being located entirely within the envelope and joined at its rear side in heat conducting relation with the major portion of the conduit, said absorber being sized so as to closely fit within the envelope such that the lateral edges of the absorber are in closely spaced relation with opposite portions of interior walls of the envelope in a diametric plane thereof, said absorber defining a solar intercept area; an energy selective coating deposited on the front side of said absorber; and a plurality of support means each including a pair of opposed gripping members springably engaging the front and rear sides of the absorber near the opposed lateral edges thereof, a pair of bearing members one each coupled with a corresponding one of the gripping members, the bearing members for slidably bearing against interior walls of the envelope at contact points offset from the diametric plane thereof, and a lubricating compound deposited on the bearing surfaces where they make contact with the envelope, said compound having a vapor pressure below that of the partial pressure within the envelope for preventing degradation of the evacuated condition thereof.

4,426,997

SOLAR ENERGY PANEL

Joseph A. Bette; William A. Bette, Both of Rte. 172, and James R. Bette, Kettletown Woods Rd., all of Southbury, Conn. 06488

Filed Oct. 3, 1980, Ser. No. 193,709
Int. Cl.³ F24J 3/02
U.S. Cl. 126—445 22 Claims



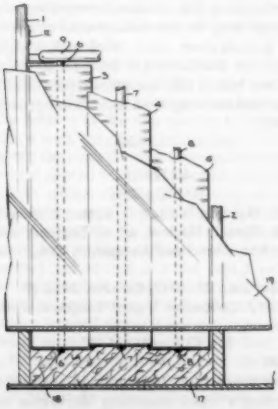
1. A solar heating panel comprising at least two separately formed, superimposed layers of longitudinally extending channel shaped panel members, said layers each including a plurality of the panel members, said panel members each having a bight portion, a pair of spaced outwardly extending leg portions and an open channel between said leg portions, the panel members in the uppermost of said layers each including a plurality of spaced longitudinally extending fins formed in their bight portions extending downwardly into the open channels defined by the panel members of the lower layer, the leg portions of the panels in the lowermost of said layers being located below the bight portions of the panels of said upper layer, and at least one sheet of transparent material overlying said upper layer of panel members and being supported on the outwardly extending leg portions thereof, whereby air flowing in the channels of said lower layer, below said upper layer, absorbs heat collected from the sun in said upper layer, said fins aiding in transferring heat from said panel members in the upper layer to the panel members in the lower layer.

4,426,998

SOLAR COLLECTOR UNIT FOR ROOF OR WALL MOUNTING

Clayton DuBosque, Jr., New Canaan, Conn., assignor to Thermatool Corp., Samford, Conn.

Filed Mar. 29, 1982, Ser. No. 362,914
Int. Cl.³ F24J 3/02
U.S. Cl. 126—448 3 Claims



1. A solar collector unit installation on a building having an exterior covering supported by spaced structural elements interiorly of said covering, said installation comprising:

a solar collector unit mounted between, and secured to, said elements interiorly of said covering, said unit comprising three separate metal strips in side-by-side relation and three tubes, each tube being secured in heat conducting relation to a different one of said strips and being in spaced relation to the other tubes to provide one tube intermediate and spaced from the other two tubes and the combined width of said strips being less than but substantially equal to the spacing between said elements and said unit comprising a pair of headers, one of said headers being disposed at one end of said unit and the other of said headers being disposed at the other end of said unit, the intermediate tube being connected at one end to said one header for fluid flow therebetween and being free of fluid flow connection at its other end to said other header and one end of each of the other tubes being connected to said one header for fluid flow therebetween and the other end of each of the other tubes being connected to said other header for fluid flow therebetween, said intermediate tube having a bore of a cross-sectional area which is at least substantially equal to the sum of the cross-sectional areas of the bores of the other tubes;

said exterior covering having a sun energy transparent portion exteriorly of said strip to permit sun energy to strike said strip;

insulation material filling the space between said elements which is interiorly of said unit; and

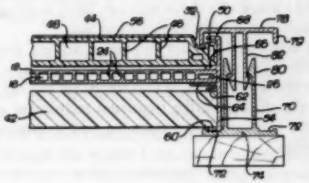
means for connecting said other header and said other end of said intermediate tube to a fluid source for circulating a fluid through said tubes and said headers.

4,426,999

SOLAR ENERGY COLLECTOR

Joseph H. Evans, Tempe; Jeffrey J. Hatman, Scottsdale, and William E. Clark, Mesa, all of Ariz., assignors to Ramada Energy Systems, Inc., Tempe, Ariz.

Filed Feb. 18, 1982, Ser. No. 350,290
Int. Cl.³ F24J 3/02
U.S. Cl. 126—450 14 Claims



1. A solar collector comprising:

(a) an upper glazing structure of clear plastic material having a first plurality of integral, open channels formed therein and extending along the length thereof, said glazing structure allowing the passage of solar radiation therethrough;

(b) a central fluid panel providing a second plurality of integral, open channels formed therein and extending along the length thereof for fluid flow from one end thereof to the other, said fluid panel configured to absorb solar radiation and transfer it to said fluid;

(c) a lower layer of insulating material forming a heat barrier;

(d) manifold means for directing fluid into and out of said second plurality of channels in said fluid panel, said manifold means having an outwardly extending plenum joined to each said fluid panel adjacent said channels;

(e) engaging means having a plurality of outwardly extending protrusions for engaging elements (a), (b) and (c)

individually so as to secure said elements along the length thereof in a predetermined spaced configuration;

(f) rail members joined to said engaging means for positioning and securing said solar collector to a support structure; and

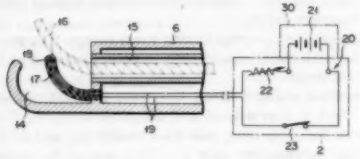
(g) elongated cap strips selectively joined to each said rail member, each said cap strip including an outwardly extending arm urging said engaging means against said rail members.

4,427,000

ENDOSCOPE HAVING A TEMPERATURE SENSITIVE MEMORY ALLOY PLATE AS THE TREATMENT INSTRUMENT DRIVING DEVICE

Yasuhiro Ueda, Kokubunji, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Jun. 30, 1982, Ser. No. 393,817
Claims priority, application Japan, Jul. 13, 1981, 56-109036
Int. Cl.³ A61B *1/06*
U.S. Cl. 128—6 **7 Claims**



1. In an endoscope having a control section, an insertion section with a proximal and distal end, a treatment instrument, a treatment instrument closet, and an instrument channel, the improvement comprising:

a treatment instrument driving device comprising:

a treatment driving member protruding into said treatment instrument closet provided in said distal portion of said endoscope, and adjacent to said channel provided in said endoscope in which is inserted detachably a treatment instrument, said treatment driving member being formed of a shape memory alloy varying in shape in accordance with temperature, and

means connected to said treatment driving member for supplying a current to said treatment driving member to raise the temperature of said treatment driving member, thereby displacing the treatment instrument according to the varying of the shape of said treatment driving member.

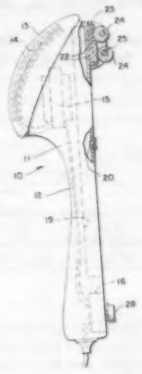
4,427,001

ELECTRICAL FACIAL MASSAGE APPARATUS

Mercedes Kiefer, c/o George Spector 3615 Woolworth Bldg. 233 Broadway, and George Spector, 3615 Woolworth Bldg. 233 Broadway, both of New York, N.Y. 10007

Filed Nov. 28, 1980, Ser. No. 211,080
Int. Cl.³ A61H *29/00*
U.S. Cl. 128—24.4 **1 Claim**

1. An electro facial therapeutic device, comprising in combination, an elongated main body having a handle at one end, a plate shaped like spoon at an opposite end of said main body, said oposite end having a vibratory applicator at a rear side of said opposite end and electric heating means inside said main body for selectively heating said plate, said plate having a convex surface at the front side of said plate wherein said heating means comprises an electric heating coil located adjacent the convex surface wherein said applicator includes a reservoir for applicator material and exterior sponge and rollers for applying said material from said reservoir via perforations through said reservoir adjacent said sponge wherein the rollers abutt the sponge and are eccentrically mounted on said



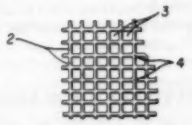
device, said rollers include zig zag grooves for laterally flexing the user's skin.

4,427,002

COLD WATER CURABLE ORTHOPEDIC CAST

Kenneth S. Baron, San Ramon, and David W. Wood, San Francisco, both of Calif., assignors to Hexcel Corporation, San Francisco, Calif.

Filed Nov. 18, 1981, Ser. No. 322,657
Int. Cl.³ A61F *5/04*
U.S. Cl. 128—83 **23 Claims**



1. A bandage material for forming in place an orthopedic cast comprising a pliant, large mesh fabric carrier formed from a knot of a high-strength, high-modulus yarn with a low mixture pick-up, the fabric carrier having openings of relatively large transverse dimension, and being coated with a polymer composition comprising (a) a cold water curable polyurethane prepolymer comprising the reaction product of a polyalkylene ether diol, a polyalkylene ether triol and a diisocyanate, wherein the ratio of diol to triol is from 1:9 to 9:1 and (b) an amine catalyst not bound into the prepolymer until formation of the bandage, thus allowing for a more homogeneous cure of the prepolymer.

4,427,003

BANDAGES

Jack Fennimore, Welwyn; William D. Potter, Bishops Stortford, and Sinan B. Kiamil, Harlow, all of England, assignors to Smith & Nephew Associated Companies Ltd., London, England

Filed Jan. 25, 1982, Ser. No. 342,519
Claims priority, application United Kingdom, Feb. 9, 1981, 8103916
Int. Cl.³ A61L *15/07*
U.S. Cl. 128—90 **11 Claims**

1. A water hardenable splinting bandage comprising a flexible fabric carrying a water absorbing isocyanate terminated prepolymer having a reaction functionality of not less than two in admixture with a solid inorganic catalyst that has an alkaline

reaction with water, said inorganic catalyst being water-soluble but insoluble in the prepolymer.

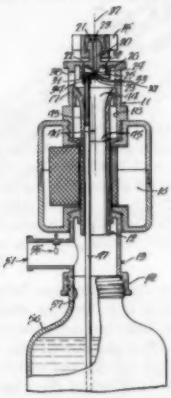
11. A method of making water hardenable splinting bandages as described in claim **1** which comprises coating or impregnating a flexible fabric carrier with a mixture of said water absorbing isocyanate terminated prepolymer and said solid water soluble catalyst which is insoluble in the prepolymer.

4,427,004

ANNULAR FLOW ENTRAINMENT NEBULIZER

Kenneth G. Miller, Palatine, Ill., assignor to Viridan Inc., Wheeling, Ill.

Filed Mar. 16, 1981, Ser. No. 244,012
Int. Cl.³ A61M *11/00*
U.S. Cl. 128—200.21 **5 Claims**



1. An entrainment nebulizer adapted for use in inhalation therapy, the nebulizer comprising:

(a) a shell having walls defining an interior space and an ambient air intake through one of the walls;

(b) a nebulizer conduit having a proximal end and a distal end and a longitudinal fluid passageway between the ends, the proximal end having an attachment means to place the passageway in fluid communication with an external pressurized gas source, the distal end inwardly tapering to define a nozzle having an orifice in fluid communication with the passageway, the conduit being mounted to penetrate a wall of the shell so that at least the nozzle extends into the interior space;

(c) a nebulizer cup having a bottom and being mounted within the interior space of the shell to axially surround the nozzle to define an annular chamber around the nozzle, the bottom of the cup having a concave depression defining a well, the nozzle protruding to a predetermined depth into the well, the well surrounding a dispensing port selectively spaced from and in substantial alignment with the nozzle orifice, the cup also having an inlet to receive a liquid source, and the well and the port being spatially associated with the nozzle orifice to develop an aerosol flow produced by the confluence of fluid streams from the pressurized gas source and the liquid source, the well permitting the angular confluence of the liquid stream into the gas stream enhancing nebulization of the liquid stream;

(d) a hollow tapered throat having a large end and a small end being mounted within the shell distal from the port with the large end directed toward the port, the throat operably associated with the air intake to draw ambient air through the intake and mix the ambient air with the aerosol to produce an inhalation mixture;

(e) a thermally-conductive tubular core having a first end removably seated against the small end of the throat and a second end, the core being in fluid communication with the throat to receive and further conduct the inhalation mixture, the shell, nebulizer conduit, nebulizer cup and throat defining a nebulizer head;

(f) a container having an opening for supplying the liquid source to the nebulizer head, a closure mounted over said container opening, the second end of said core being mounted through said closure such that said core and throat are in alignment with said container opening whereby said container is in fluid communication with the throat and sealably mounted to the nebulizer head;

(g) said closure having an outlet in fluid communication with the core to dispense the inhalation mixture; and,

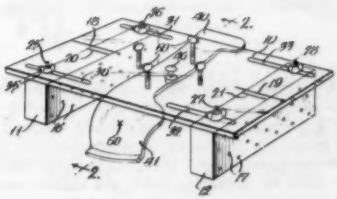
(h) a tube connected to the cup inlet and extending into the container to conduct the liquid source into the chamber.

4,427,005

APPARATUS AND METHOD FOR TREATING BREAST TUMORS

William S. Tener, 69 Timberline Dr., Oreana, Ill. 62554

Filed Mar. 4, 1982, Ser. No. 354,597
Int. Cl.³ A61B *17/00*
U.S. Cl. 128—303 R **9 Claims**



1. A method of treating breast tumors comprising the steps of placing a control mark on the patient's skin to denote the center of the field to be treated, forming a shell with a part conforming to a portion of the patient's breast encompassing said mark and placing a reference mark on said part, placing said shell part on the patient's breast in a position to have said reference mark coincident with said control mark, mounting said shell to the bridge of a template, said template having a pair of spaced-apart template blocks depending from said bridge and with pre-drilled needle holes therein which are aligned in said two blocks, orienting said template relative to said shell for desired needle placement through the breast by passage through the needle holes while maintaining said control and reference marks coincident, fixing the position of the shell relative to the template with the template above the breast, passing the desired needles through said needle holes, and thereafter substituting tubing for the needles which tubing receives radioactive seeds.

4,427,006

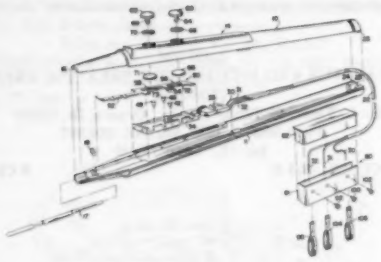
ELECTROSURGICAL INSTRUMENTS

James E. Nottke, Seminole, Fla., assignor to Medical Research Associates, Ltd. #1, Clearwater, Fla.

Filed Jan. 18, 1982, Ser. No. 339,851
Int. Cl.³ A61B *17/39*
U.S. Cl. 128—303.14 **1 Claim**

1. An electrosurgical instrument for providing an interface between an electrosurgical electrode and an electrosurgical generator and for selectively providing electrical energy to said electrode for cutting, coagulation and the like, comprising: an elongated hollow handle forming a housing having a first opening in its distal end for receiving said electrode and a second opening in its proximal end for receiving a cable; means in said first opening for forming a watertight seal when said

electrode is inserted in said first opening; a cable having first, second and third wires extending through said second opening into said housing, said cable forming a watertight seal with inwardly directed flanges surrounding said second opening; insert means in said housing for supporting and positioning said wires; a contact pin in electrical communication with each of said wires; a conductor plate overlying said insert means, said plate having a first conductor strip positioned to contact said electrode, a second conductor strip contacting a first contact pin, a third conductor strip overlying a second contact pin and a fourth conductor strip overlying a third contact pin, said third and fourth strips being adapted to be depressed into contact with their respective contact pins; a first switch button



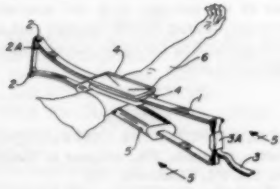
mounted for communication with said third conductor strip through an aperture in said housing; a second switch button mounted for communication with said fourth conductor strip through a second aperture in said housing; snap dome springs mounted between said switch buttons and said third and fourth conductor strips for providing tactile and audible sensations when said switch buttons are depressed; protuberances formed on the surfaces of said third and fourth conductor strips under said snap dome springs for assuring activation of said strips and for preventing said springs from becoming inverted; and diaphragm seals around said switch buttons to prevent moisture from entering said housing thereby providing, in combination with the seals at said first and second openings, a watertight compartment within said housing.

4,427,007

UNIVERSAL POWER COMPRESS

Thomas A. Rexroth, 522 Melville, West Burlington, Iowa 52655

Filed Aug. 16, 1979, Ser. No. 66,923
Int. Cl.³ A61B 17/12
U.S. Cl. 128—325 **2 Claims**



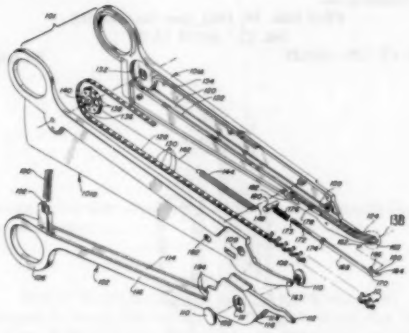
1. A universal power compress comprised of a slightly curved and slightly flexible first member, a slightly curved and slightly flexible second member, a flexible hinge strap pivotably connecting one end of the first member to one end of the second member, a pressure plate attached to one side of the first member, a second pressure plate attached to the opposite side of the first member, padding surrounding a portion of the second member, a flexible locking strap pivotably attached to the first member, a second flexible locking strap pivotably attached to the second member and an adjustable locking device connecting the flexible locking straps.

4,427,008

MULTIPLE LIGATING CLIP APPLIER WITH ROCKING ESCAPEMENT

James A. Transue, Union, N.J., assignor to Ethicon, Inc., Somerville, N.J.

Filed Feb. 26, 1982, Ser. No. 352,750
Int. Cl.³ A61B 17/12
U.S. Cl. 128—325 **13 Claims**



13. A scissors-type medical instrument for repeatedly applying a plurality of ligating clips seriatim about tissue wherein each said clip is initially provided in an open state and wherein each said clip includes: first and second legs which are joined at a leg connection end of the clip and which are spaced apart at their distal ends at the front of the clip; said instrument comprising:

first and second handles mounted together for pivotal movement about a pivot axis, each said handle extending forwardly beyond the pivot axis to form a clip closing jaw;

said first handle including a guideway for receiving a plurality of said open clips in a single row with the clips arranged in end-to-end relationship with the distal end of said first leg of one clip abutting the leg connection end of the next forwardly adjacent clip, said first handle including clip retaining means for engaging each said clip to retain said clips in sliding engagement within said first handle in said guideway;

means for moving said row of clips forwardly along said guideway to said jaws;

an escapement member at said first handle jaw mounted for pivotal movement about an axis generally parallel with said handle pivot axis between a first orientation and a second orientation, said escapement member including a forward protuberance adapted to project into said guideway in said first handle jaw to engage a portion of a clip to prevent the passage of the engaged clip therepast when said escapement member is in said first orientation but permitting the passage of the clip therepast when the escapement member is in said second orientation, said escapement member having a rearward protuberance spaced rearwardly from said forward protuberance, said rearward protuberance being adapted to project into said guideway to engage a portion of the next rearwardly adjacent clip to prevent the passage of that clip therepast when said escapement member is in said second orientation but permitting the passage of that clip therepast when said escapement member is in said first orientation;

a rod hingedly connected with said escapement member and extending rearwardly from said escapement member along said first handle;

means associated with said rod and with said second handle

for moving said rod rearwardly when said handles are moved toward one another a sufficient amount so as to squeeze together and close the front clip in the row whereby said escapement member pivots to said second orientation in which (1) said forward protuberance permits discharge of a closed clip from the jaws when the jaws are subsequently partially opened, and (2) said rearward protuberance prevents forward movement of the next rearwardly adjacent open clip into said jaws; and

means for biasing said rod forwardly when said handles are moved away from one another a sufficient amount to open said jaws further beyond said partially opened position whereby said escapement member pivots to said first orientation in which (1) said rearward protuberance permits passage of said next clip to said jaws and (2) said forward protuberance engages said next clip to maintain the next clip between the jaws.

4,427,009

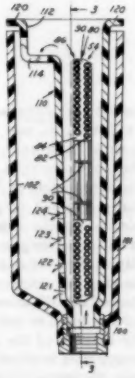
INTEGRATED CARDIOPLEGIA DELIVERY SYSTEM

Edward S. Wells, Whitmore Lake; Spencer K. Ford, Dexter; Jack E. Werner, Ann Arbor, and Erin J. Lindsay, Dexter, all of Mich., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Jun. 30, 1981, Ser. No. 279,175

Int. Cl.³ A61F *7/00*

U.S. Cl. 128—400 **5 Claims**



1. In a cardioplegia system in which cardioplegia medication or a mixture of arterial blood and medication is delivered to the heart of a patient during open heart surgery, and including a cooling medium and apparatus for cooling the cardioplegic fluid flowing to the heart, an improvement in a cooling system utilizing a source of ice water or the like which comprises:

(a) a relatively flat heat exchange unit formed of one or more coaxial coils of multiple convolutions of tubing disposed around an axis having inlet and outlet ends at one general area of the periphery of said coils, for passing the cardioplegic fluid to be cooled therethrough,

(b) a first relatively flat vertical chamber to receive said unit through an opening in one side thereof, said chamber having a bottom inlet for said cooling medium, an overflow for said cooling medium adjacent the top thereof, and one or more openings in one wall of said chamber disposed to control both the overflow level of cooling medium from said chamber and the area of said coils immersed in the cooling medium.

4,427,010

METHOD AND MEANS FOR COOLING INJURED PARTS OR AREAS OF A HUMAN OR ANIMAL BODY

Günter H. Marx, Postfach 1224, Günter-Caracciola-Str. 10, D-8035 Gauting, Fed. Rep. of Germany

Filed Oct. 15, 1981, Ser. No. 311,863

Claims priority, application Fed. Rep. of Germany, Oct. 18, 1980, 3039468

Int. Cl.³ A61F *7/00*; F25D *5/00*

U.S. Cl. 128—402 **3 Claims**

1. A method of cooling an injured part of a human or animal body, wherein xylite ($C_5H_{12}O_5$) in crystalline form is dissolved in an aqueous or non-aqueous fluid and the resulting solution, while undergoing an endothermic reaction, is brought into direct or indirect contact with said part of the body.

4,427,011

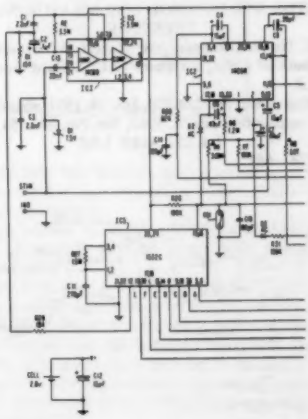
TACHYCARDIA CONTROL PACER WITH IMPROVED DETECTION OF TACHYCARDIA TERMINATION

Roworth A. J. Spurrell, London, England; Tibor A. Nappholz, Drummoyne, and Stephen J. Swift, Hornsby, both of Australia, assignors to Telectronics Pty. Ltd., Lane Cove, Australia

Filed Mar. 18, 1982, Ser. No. 359,364

Int. Cl.³ A61N *1/36*

U.S. Cl. 128—419 PG **18 Claims**



1. A tachycardia control pacer comprising means for sensing a patient's heartbeats; means for confirming the presence of tachycardia dependent upon the rate at which heartbeats are sensed; means for applying at least one stimulating pulse to said patient's heart in an attempt to terminate tachycardia responsive to a tachycardia confirmation; and means for determining the termination of tachycardia dependent upon at least two successive sensed heartbeats, but excluding at least the first two which follow operation of said pulse applying means, being separated by a time interval greater than a predetermined minimum.

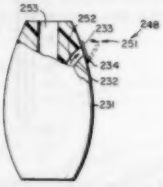
4,427,012
ENEMA APPARATA IMPROVEMENTS RELATING TO DOUBLE CONTRAST STUDIES

Roscoe E. Miller, 7400 West 88th St., Indianapolis, Ind. 46278

Division of Ser. No. 347,900, Feb. 11, 1982, which is a continuation-in-part of Ser. No. 131,965, Apr. 4, 1980, Pat. No. 4,333,460, which is a continuation-in-part of Ser. No. 39,502, May 16, 1979, abandoned. This application Mar. 30, 1983, Ser. No. 470,247

Int. Cl.³ A61B *5/00*

U.S. Cl. 128—654 **3 Claims**



1. An enema administering apparatus insertable into the rectum for delivery of a contrast medium to internal portions of a patient's anatomy, said enema administering device comprising:

an enlarged tip portion including a contrast medium passageway and air passageway mans disposed external of said contrast medium passageway and having an air delivery outlet opening; and

valve means disposed adjacent to said air delivery outlet opening and adapted for regulating the flow into and out of said air passageway means.

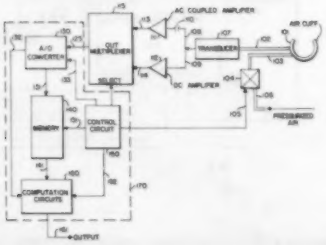
4,427,013
APPARATUS AND METHOD FOR MEASURING BLOOD PRESSURE

Donald E. Nunn, Glendora, and Robert W. Beveridge, Cosa Mesa, both of Calif., assignors to C.R. Bard, Inc., Murray Hill, N.J.

Continuation of Ser. No. 229,320, Jan. 29, 1981, abandoned. This application Jun. 8, 1983, Ser. No. 502,151

Int. Cl.³ A61B *5/02*

U.S. Cl. 128—681 **15 Claims**



1. A non-invasive method for measuring systolic blood pressure in a body member, including the steps of:

A. occluding blood flow in said body member by applying a variable and measurable external pressure to said member;

B. varying said pressure between a magnitude whereat said blood flow is substantially occluded and a magnitude whereat said blood flow is substantially unoccluded;

C. measuring, at a plurality of pressure values, the peak-to-peak oscillation magnitude of oscillations in said external pressure caused by blood flow pulses in said body member;

D. storing a plurality of readings, each of said readings consisting of a pressure value and a corresponding oscillation magnitude, said stored readings forming a curve when plotted against each other;

E. determining an expected value of said systolic blood pressure; and

F. determining a selected pressure at or near said expected value at which the rate of change of the magnitude of said oscillations with respect to changes in said applied pressure undergoes a change.

4,427,014
BIOPSY FORCEPS

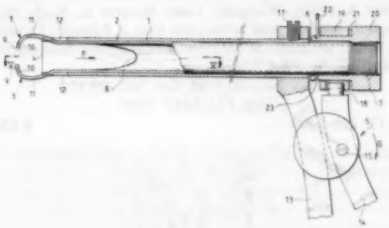
Roger P. Bel, Massy; Michel M. Regnier, Ris-Orangis, and Martial E. Hascoët, Paris, all of France, assignors to Metallisations et Traitements Optiques M.T.O., Massy, France

Filed Jun. 17, 1981, Ser. No. 274,514

Claims priority, application France, May 6, 1981, 81 09035

Int. Cl.³ A61B *10/00*

U.S. Cl. 128—751 **4 Claims**



1. Biopsy forceps for use with a contact endoscope having a body terminating in a distal end, said forceps comprising a hollow outer tube open at both ends, a hollow inner tube located coaxially within the outer tube, said inner tube being open at its rear end and terminating at its front end in at least one pair of diametrically opposed tongues that extend outwardly beyond the front end of the outer tube and in a direction substantially parallel to the longitudinal axis of the tubes and then bend inwardly at their far end at right angles to the longitudinal axis terminating in a series of teeth to form forceps jaws, the jaws being biased in a direction away from the axis, whereby movement of the tubes in one direction relative to one another causes the tongues of the jaws to slide into the outer tube and the forceps jaws to close and movement in the opposite direction causes the jaws to open, and control means for axially moving one of the tubes relative to the other to activate the jaws, whereby the endoscope can be inserted all the way through the forceps so that the distal end of the endoscope lies against the forceps jaws.

4,427,015
SYRINGE FOR USE IN THE WITHDRAWAL OF ARTERIAL BLOOD

Ralph Redeaux, Jr., 3516 Greinwich Blvd., Lake Charles, La. 70605

Continuation-in-part of Ser. No. 157,193, Jun. 6, 1980, abandoned. This application Oct. 16, 1981, Ser. No. 311,938

Int. Cl.³ A61B *5/14*

U.S. Cl. 128—765 **1 Claim**

1. In apparatus useful for the collection of arterial blood which embodies

a tubular body, inclusive of a chamber of relatively large diameter formed therein by an enclosing wall, said tubular body having a forward end and a rearward end,

a tubular needle having a dispensing end affixed on the

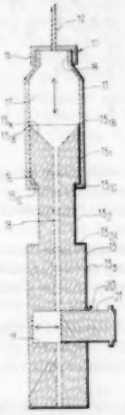
forward end of said tubular body, said needle having an opening therethrough being in communication with said chamber,

a plunger having a forward portion and a rearward portion reciprocably fitted within the chamber of said tubular body, the external diameter of the forward portion of which is substantially equal to the internal diameter of the chamber within which the forward portion of said plunger is fitted,

the improvement comprising

a frusto-conic shaped entry, the included angle formed by the frusto-conic entry ranging from about 45° to about 135°, located in the forward portion of the plunger to provide a permanent opening into the chamber regardless of the position of the plunger,

a capillary bore extending from the apex of said frusto-conic



shaped entry in the forward portion of said plunger throughout the length of the plunger, and

a fast acting valve located within the rearward portion of the plunger, said valve being formed by a lateral opening extending from an outer surface of the plunger to intersect the capillary bore, and a stem slidably movable within said lateral opening for rapidly closing the valve by closure of said capillary bore and thereby creating an obstruction in the bore, or movable within said opening for opening the valve by removing from the bore the obstruction created by the stem,

whereby, with the valve open and the plunger positioned to adjust the size of the chamber, the dispensing end of the tubular needle is adapted to be inserted within an artery and arterial blood collected until such time that the chamber is filled, and the valve then closed to trap the arterial blood within the chamber.

4,427,016

COMBINATION ASH-TRAY

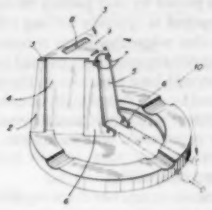
Ralph H. Orter, P.O. Box 2074, Prescott, Ariz. 86302

Filed Jun. 30, 1980, Ser. No. 164,061

Int. Cl.³ A24F *19/00*

U.S. Cl. 131—238 **1 Claim**

1. An ashtray having a three sided portion extending upright therefrom, two sides of said upright portion having pairs of slide-in grooves to accomodate advertising material and the third side of said upright portion including a semi-circular flue means extending the length thereof and positioned above the center of the ashtray, said flue means including attaching bracket means at the lower end of thereof and holding means at the upper end of said flue means; a semi-circular tray means having pin means pivotally attached to said to said bracket means, and prong means at the opposite end of the said tray means for securement with said holding means; said tray means further including an opening in the lower end thereof and prong means to prevent cigarette slide-down; whereby said tray means may be rotated to a horizontal position relative to



the ashtray for holding a lighted cigarette, or positioned in a vertical position to be engaged with said semi-circular flue means to hold a lighted cigarette with its lit end downward; the opening in said tray means creating an up draft which sustains the cigarette in a lighted condition.

4,427,017

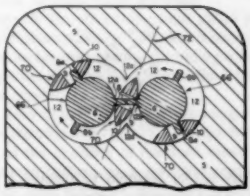
HAIR BRAIDER

Iheanyichukwu E. Eronini, 1728 Taylor St., NW., Washington, D.C. 20011

Filed Oct. 5, 1981, Ser. No. 308,674

Int. Cl.³ A45D *1/00*

U.S. Cl. 132—9 **1 Claim**



1. In a hand held hair braiding device including a housing with a bottom section, an intermediate section, and a top section in spaced arrangement,

said bottom section including a plurality of hair parting members extending at right angles from beneath said bottom section,

said intermediate section including a figure eight shaped, opening therethrough formed by the intersection of two substantially identical circular openings further including a ledge formed near the bottom thereof and extending perpendicularly away from the wall of opening,

said top section including two circular openings spaced to be centered above each of said two circular openings of said intermediate section;

two drive shafts each arranged to extend through said openings in said top section wherein each of said drive shafts includes

a drive gear which extends above and is larger in diameter than each of said openings in said top section,

and driving means extending from said drive shaft a distance not to exceed the radius of said circular openings in said intermediate section and spaced a distance down said shaft from said drive gear to correspond with the openings in said intermediate section;

a plurality of hair grabbing members each including a top portion and a hair gripping portion wherein,

said hair gripping portion is connected to said top portion,

said top portion includes a coupling means cooperating with said driving means,

said top portion is held in interengaging relation with said driving means by said wall and said ledge,

said hair gripping portion including means for retaining hair as it is parted by said parting members;

and a motor disposed in opposite driving relation to each of said gears so that when the motor is operated, said drive shafts and said driving means are rotated in opposite directions to move said hair members in the path of a figure eight as defined by said figure eight opening, causing each of said parted hair sections retained by said hair gripping portion to be interwoven with each other to form a tight braid;

the improvement comprising:

said driving means comprises three equally spaced paddle like elements extending radially from said drive shaft,

said hair grabbing member each include an oval shaped top portion defined by two intersecting arcs having the same radius of curvature as that of said circular openings in said intermediate section,

and said coupling means includes a rectangular slot shaped to receive in succession each of said paddle like elements as said paddle like elements are rotated by said drive shaft.

4,427,018

DENTAL FLOSS HOLDER

Yves Lagace, 1re Avenue Nord, Weedon, Quebec, Canada J0B 3J0

Filed Apr. 5, 1982, Ser. No. 365,490
Int. Cl.³ A61C *15/00*
U.S. Cl. 132—91 **5 Claims**

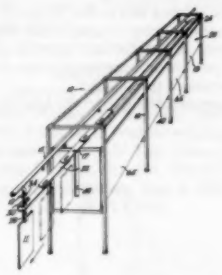
1. A dental floss holder adapted to receive a dental floss having at least two enlargements formed thereon and spaced one from another by a predetermined length, for holding said length of floss under tension, said holder comprising an elongated handle and a bifurcated head at one end of said handle, said bifurcated head having a pair of opposed spaced-apart resilient arms defining a gap between terminal ends thereof with said gap having a width greater than said predetermined length, each terminal end of said arms being provided with an outwardly extending flange and a floss receiving groove, the groove at one terminal end being aligned with the groove at the other terminal end and each said groove having a bottom defined by a rounded convex surface for frictionless engagement with floss positionable therein, the flange of each arm including a pair of opposed flange portions defining, as an extension of the groove, a guide opening therebetween for guiding floss and maintaining same positioned on said bottom surface at each said terminal end, said guide opening being smaller than said enlargements such that each said pair of flange portions at each said terminal end serve as respective pair of abutment shoulder portions to thereby define first anchoring means for releasably securing said floss such that said length thereof when bridging said gap is maintained under tension by outward resilient force exerted by said arms, whereby when a respective one of said two enlargements is anchored against a respective one of said pairs of abutment shoulder portions adjacent a respective one of said guide openings with the length of floss between said two enlargements extending through said guide openings and bridging said gap, said length of floss is securely held under tension by said arms.

4,427,019

CHEMICAL PROCESS APPARATUS

Charles D. Eidschun, Clearwater, Fla., assignor to Micro-Plate, Inc., Clearwater, Fla.

Division of Ser. No. 197,073, Oct. 15, 1980, Pat. No. 4,371,422.
This application Aug. 9, 1982, Ser. No. 406,199
Int. Cl.³ B08B *3/02*
U.S. Cl. 134—72 **13 Claims**



1. A photoresist and etch modular unit for printed circuit boards comprising, in combination,

a conveyor for horizontal transport of a plurality of printed circuit boards,

a plurality of work hangers suspended from said conveyor, each of said work hangers having means at a lower portion thereof for removably securing and receiving a printed circuit board,

a photoresist chamber having a slotted end portion for receiving the vertically suspended printed circuit board,

a cover for the photoresist chamber having a slot at a center portion,

means secured to sequential work hangers to overlie the cover slot for shielding the slot in the cover,

and a plurality of additional chambers for processing the printed circuit boards all continuously aligned horizontally,

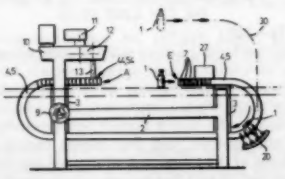
whereby a plurality of printed circuit boards are continuously processed for removal of the photoresist and the cladding while oriented in a vertical plane.

4,427,020

APPARATUS FOR THE OVERHEAD HANDLING OF BOTTLES AND THE LIKE

Hans G. Riederer, Maienfeld, Switzerland, assignor to EMPAC AG, Samstagern, Switzerland

PCT No. PCT/CH81/00028, § 371 Date Oct. 30, 1981, § 102(e) Date Oct. 30, 1981, PCT Pub. No. WO81/02567, PCT Pub. Date Sep. 17, 1981
PCT Filed Mar. 4, 1981, Ser. No. 317,899
Claims priority, application Switzerland, Mar. 4, 1980, 1698/80
Int. Cl.³ B08B *3/02*
U.S. Cl. 134—127 **4 Claims**



1. In combination with:

a system for supplying upwardly open vessels to an intake location;

a device for treating upside-down vessels at a treatment location adjacent the intake location; and

a system for taking upwardly open treated vessels from an output location adjacent the intake location, a vessel-inverting conveyor comprising:

a pair of like endless chains;

guides carrying the chains and defining a transport path lying generally in a vertical plane and having an upstream end opening horizontally at the intake location, a downstream end opening horizontally at the output location, and an intermediate portion vertically offset from the intake and output locations, the chains having substantially parallel and laterally spaced conveying stretches extending and movable downstream along the path from the intake to the output location and past the treatment location and return stretches extending and movable upstream back along and outside the respective conveying stretches between the intake and output locations;

resilient clamping elements on the chains turned laterally toward each other at the conveying stretches and projecting thereat into the transport path;

means connected to the guides for laterally displacing same and thereby laterally moving the ends of the transport path;

means for adjusting the lateral spacing between the conveying stretches in the path, whereby this lateral spacing can be generally set to be equal to the vessel diameter; and

drive means connected to at least one of the chains for advancing the conveying stretches downstream from the intake to the output location and thereby gripping upwardly open vessels at the intake location, inverting the vessels and passing same past the treatment location, and reinverting the vessels and releasing same at the output location.

4,427,021

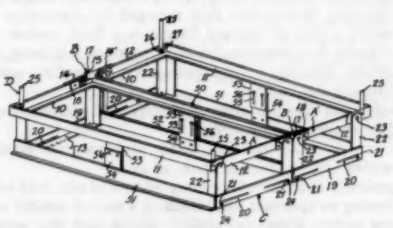
COLLAPSIBLE TENT STRUCTURE WITH ELEVATED FLOOR

Leavie Cater, Sr., 305 W. Polk St., Santa Maria, Calif. 93454

Continuation-in-part of Ser. No. 203,274, Nov. 3, 1980, abandoned. This application Sep. 21, 1982, Ser. No. 420,930

Int. Cl.³ A45F *1/16*

U.S. Cl. 135—109 **6 Claims**



1. In a collapsible tent structure, in combination with a floor structure comprising:

means defining said collapsible tent structure supported by a floor structure, said floor structure comprising two substantially rectangular sections each including a frame comprising a pair of parallel side bars joined by a pair of parallel cross bar;

supports for elevation of the respective frames above ground level, each support comprising an elongated leg, each leg being pivotally attached at one end thereof to a respective end of a said side bar, a pair of ground engaging side bars and a pair of ground engaging cross bars, said ground engaging side bars having in respective end portions thereof, longitudinal slots disposed in vertical planes;

and pivotal connections between the other end of each of said legs and said slots,

whereby said legs may be folded upwardly into close association with the respective floor structure side bars;

and hinges joining the respective sections to one another for folding one upon the other.

4,427,022

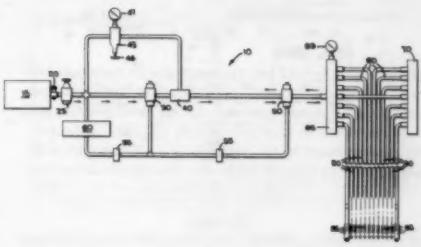
APPARATUS FOR ADJUSTING SIMULTANEOUSLY FLUID PRESSURE IN A PLURALITY OF PRESSURE VESSELS

Victor D. Forney, Bakersfield, Calif., assignor to Eugene A. Frost, Bakersfield, Calif.

Filed Nov. 22, 1978, Ser. No. 962,911

Int. Cl.³ G05D *16/00*

U.S. Cl. 137—224 **8 Claims**



1. Apparatus for simultaneously controlling the fluid pressure in a plurality of vessels comprising:

(a) a source of fluid under pressure;

(b) a reservoir for containing fluid under pressure;

(c) means communicating with said reservoir and said source of fluid under pressure for providing a flow of fluid under pressure between said source of fluid under pressure and said reservoir;

(d) a plurality of conduits communicating with said reservoir for conducting fluid under pressure between said reservoir and the plurality of pressure vessels;

(e) said means comprising a normally opened valve disposed between said reservoir and said source of fluid under pressure, said valve being operative to shut-off the flow of fluid under pressure in said means in response to detecting a preselected fluid pressure from fluid flowing away from said reservoir and toward said valve; and

(f) a first regulating device communicating with said valve for controlling the operation of said valve, whereby said valve closes in response to detecting a preselected fluid flowing away from said reservoir and toward said valve, said valve being a relay valve,

(g) said means comprises a second regulating device disposed between said source of fluid pressure and said relay valve for controlling the range of the fluid pressure of the fluid under pressure flowing from said source of fluid under pressure.

4,427,023

DRY PRODUCT VALVE

James D. Greaves, Solon, Ohio, assignor to General Signal Corporation, Stamford, Conn.

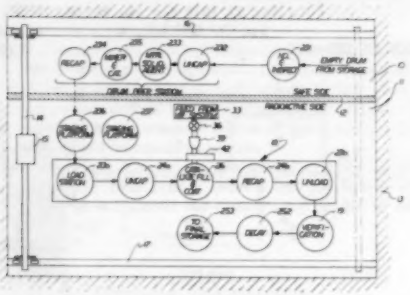
Filed Mar. 27, 1981, Ser. No. 248,194

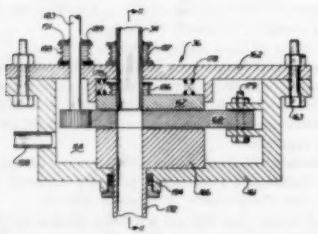
Int. Cl.³ B08B *3/04*; F16K *25/00*

U.S. Cl. 137—240 **8 Claims**

1. A valve system for controlling dry particulate radioactive material or the like, comprising a housing defining a pressure chamber and means for pressurizing said chamber, valve means in said chamber providing first and second spaced valve surfaces, a movable valve member providing third and fourth valve surfaces respectively mating and sealing with said first

and second valve surfaces, first and second flow passages respectively open through said first and second valve surfaces, a third passage in said valve member open through said third and fourth valve surfaces, said valve member connecting said first and second passages through said third passage when said valve member is in an open position and isolating said first and second passages when said valve member is in a closed position, resilient means urging said valve surfaces into mating and sealing engagement without clearance, first and second conduits respectively connected to said first and second passages, the connection between at least one of said conduits and its associated passage being slidable to permit free movement of





said valve surfaces toward and away from each other under the influence of said resilient means, at least one of said valve surfaces having a purging opening therein opened to said third passage when said valve member moves between said opened and closed position, and isolated therefrom when said valve is fully opened, the pressure in said chamber causing flow through said purging opening and purging of said third passage as said valve member moves between said opened and closed positions, said pressure in said chamber being maintained higher than the pressure in said first, second and third passages at least while said valve member is moving between said opened and closed position to prevent any flow of radioactive particulate out of said passages into said chamber.

4,427,024

FLEXIBLE STANDPIPE AND SUBSURFACE PRESSURE SEAL

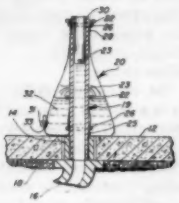
Michael A. Gregory, 3310 N. Clifton, Chicago, Ill. 60657, and Glenn N. Traeger, 945 NE. Hazelfern, Portland, Oreg. 97232

Filed Aug. 26, 1981, Ser. No. 296,316

Int. Cl.³ F16L *5/00*

U.S. Cl. 137—362 **11 Claims**

1. In an apparatus comprising a standpipe penetrating a floor surface for the relief of subsurface fluid pressure, an expansible receptacle in communication with the interior of said standpipe, said expansible receptacle surrounding said standpipe adjacent its lower edge above said floor surface, wherein increased pressure within said expansible receptacle urges the same into contact with the exposed floor surface so as to make



sealing engagement with said floor surface about the periphery of said standpipe.

4,427,025

SWING CHECK VALVE

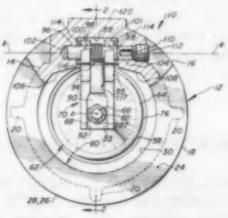
Darryll G. Prince, Norman, Okla., assignor to Prince Valve, Inc., Norman, Okla.

Continuation of Ser. No. 44,225, May 31, 1979, Pat. No. 4,304,255. This application Sep. 8, 1981, Ser. No. 299,998

The portion of the term of this patent subsequent to Dec. 8, 1998, has been disclaimed.

Int. Cl.³ F16K *15/03*

U.S. Cl. 137—527.4 **6 Claims**



1. A swing check valve comprising:

a generally cylindrical body having an upstream face and an opposing downstream face arranged for disposition between a pair of opposed flanges in a fluid conduit and defining therebetween the axial length of said body, and means defining a fluid passageway extending axially through said body;

a valve seat disposed within said body, said seat including a first annular seating surface;

an arm pivotally mounted within said body for rotation within said passageway about an axis;

a generally circular valve connected to said arm, said valve having an upstream face including a second annular seating surface adapted to sealably engage said first annular seating surface when said valve is in a closed position;

first and second coaxial cylindrical bores of uniform diameter in said body, said first bore extending partially through said body and being closed at one end and opening at its opposite end into said passageway, and said second bore being axially spaced from said first bore and opening at one end into said passageway and at its opposite end to an exterior wall surface of said body;

a substantially uniform diameter cylindrical pivot pin dimensioned to be a free sliding fit in said first and second bores and insertable entirely within said body through said second bore for supporting said arm for rotation within said passageway;

means for closing said second bore at said exterior wall surface for retaining said pivot pin in said bores; and

means on the end of said pivot pin disposed in said second bore for removing said pivot pin from said bores after removal of said means for retaining said pivot pin in said bores.

4,427,026

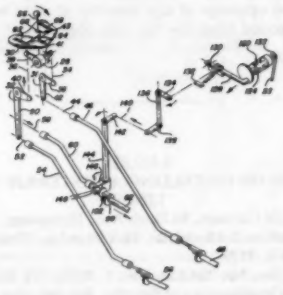
LIMIT CONTROL FOR AN OPERATING MEMBER

Glen S. Comer, Jr., Dunlap, and Henry Ejchler, East Peoria, both of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Division of Ser. No. 73,409, Feb. 2, 1979, Pat. No. 4,301,834. This application Jul. 31, 1981, Ser. No. 288,945

Int. Cl.³ F16K *11/18*

U.S. Cl. 137—556 **6 Claims**



1. In a limit control for an operating member (22) on a vehicle having hydraulic means for driving said operating member (22), a valve (94) connected with said hydraulic means and having a valve spool (62) for controlling the drive of said operating member (22) and an actuating lever (26) for manually operating the valve spool (62), the improvement comprising:

first means (122) for limiting the movement of said operating member (22), said limit means (122) being operable as said operating member (22) approaches the limit of movement of said operating member (22); and

linkage means (128, 132, 136, 140, 144) for connecting said limit means (122) to said valve spool (62);

at least a portion of said linkage means being separate from said actuating lever (26) and engaging second means (102, 99) operably associated with the valve spool (62) and pivoting in response to movement of said operating member, said portion of the linkage means upon pivoting imparting translatory movement through the second means (102, 99) to the valve spool (62) to achieve a neutral position wherein further movement of the operating member (22) is stopped.

4,427,027

LIQUID STORAGE TANK

Akimitsu Miyahara, Tokyo; Toshihiko Kanazawa, Sagamihara; Kokaji Takahashi, Fujisawa; Hiroji Ushikubo, Ageo, and Kuniaki Kawano, Matsudo, all of Japan, assignors to Japan Organo Co., Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 189,302, Sep. 22, 1980, Pat. No. 4,335,746. This application Feb. 5, 1982, Ser. No. 346,122

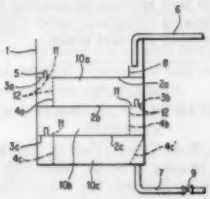
The portion of the term of this patent subsequent to Jun. 22, 1999, has been disclaimed.

Int. Cl.³ E03B *11/00*

U.S. Cl. 137—576 **9 Claims**

1. In a liquid storage tank having a multiplicity of stages of horizontal partition plates which divide the space in said tank into a plurality of storage chambers, each storage chamber having a height, said partition plates having openings for allowing a liquid to flow down therethrough from the overlying chamber to the underlying chamber, said openings being arranged in a staggered manner such that the opening of the overlying partition plate is formed at one end of said tank while the opening of the underlying partition plate is formed at the other end of said tank;

an improvement which comprises means for generating laminar flow between chambers comprising a plate provided at each of said openings and having a multiplicity of liquid passage ports; storage chamber means for generating laminar flow across chambers comprising a flow setting plate vertically provided in each of said liquid storage chambers and having a multiplicity of liquid passage ports; and an air purge pipe provided in each partition plate.



4,427,028

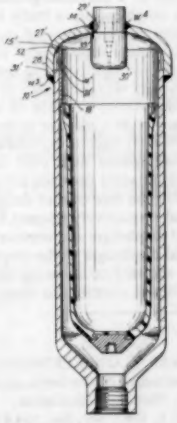
RESISTANCE WELDED ACCUMULATOR DEVICE

Alfonse A. Jacobellis, Woodland Hills, Calif., assignor to VSI Corporation, Pasadena, Calif.

Continuation-in-part of Ser. No. 250,833, Apr. 3, 1981, abandoned, which is a continuation-in-part of Ser. No. 93,041, Nov. 13, 1979, Pat. No. 4,280,533. This application Dec. 21, 1981, Ser. No. 332,456

Int. Cl.³ F16L *55/04*

U.S. Cl. 138—30 **5 Claims**



1. An accumulator device comprising a generally cylindrical pressure vessel including a first end and an open end, an oil port formed in said first end, an annular recess formed on an outer wall portion of said vessel adjacent said open end and defining a thinner tubular section, a bladder sub-assembly mounted in said open end, said sub-assembly comprising an axially elongated cylindrical metallic mounting skirt having a bladder fixedly secured to one end thereof, said skirt being disposed within said vessel with said one end nearest said first end, outer wall portions of said skirt intimately engaging inner wall portions of said vessel adjacent said open end in registry

with said thinned section, a continuous annular, seal-forming resistance weld connection located between said skirt and said thinned section of said vessel, spaced from said open end, and contiguous with said thinned section, a cap member having a gas charging valve assembly mounted in closing relation of said open end of said vessel, said cap member including a depending skirt portion outwardly lapping the outer side wall portions of said vessel adjacent said open end including said thinned section, said skirt portion terminating in a depending end portion, and a second continuous weld connection formed between said end portion and said vessel.

4,427,029

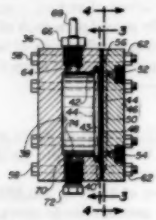
PULSE DAMPER FOR CHROMOATOGRAPHY SYSTEMS

Andrew R. Charney, State College; Paul W. Kercher, Pennsylvania Furnace, and Stanley A. Stone, State College, all of Pa., assignors to Scientific Systems, Inc., State College, Pa.

Filed Nov. 12, 1982, Ser. No. 440,810

Int. Cl.³ F16L *55/04*

U.S. Cl. 138—30 **7 Claims**



1. A pulse damper for use with a reciprocating pump in a chromatography system to minimize the effect of the pulsations of liquid delivered to a chromatography column, said damper comprising in combination, a body having a cavity extending thereinto from one face thereof, a cover having a planar inner surface extending substantially across the entire extent thereof and connected tightly to the body to close said cavity, a flexible diaphragm which initially is parallel to said planar surface extending across the face of said cavity and overlying the edges thereof in a manner to be supported and clamped tightly thereover by said cover when affixed to said body, said cover having spaced fluid inlet and outlet ports extending therethrough adjacent opposite sides of said cavity and communicating with the face of said diaphragm which is opposite said cavity and respectively adapted to transmit fluid against said face of said diaphragm and remove it therefrom in a manner to subject said diaphragm to the surges of fluid from a reciprocating pump, and said cavity being filled with a non-aqueous compressible liquid, operable to damp said surges.

4,427,030

LAMINAR FLOW ELEMENT

Wijbren Jouwsma, Veenendaal, Netherlands, assignor to Bronkhorst High-Tech BV, Vorden, Netherlands

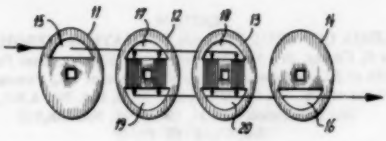
Filed Apr. 1, 1982, Ser. No. 364,475

Claims priority, application Netherlands, Sep. 22, 1981, 8104354

Int. Cl.³ F15D *1/02*

U.S. Cl. 138—42 **11 Claims**

1. Laminar flow element for mounting inside a fluid flow channel comprising a package of a plurality of juxtaposed disks, each having a front surface and a rear surface, and each disk, except the front disk and the rear disk of the package of juxtaposed disks, having a first opening through said front and rear surface and a second opening through said front and rear surface and at least one conduit extending from the first opening to the second opening, said conduit comprising a channel on the front surface of said disk, said channel being closed on its side by the next adjacent juxtaposed disk and being dimensioned to provide laminar flow in said conduit, the front disk



having a first opening and the rear disk having a second opening, the first openings of said plurality of disks being aligned and the second openings of said plurality of disks being aligned.

4,427,031

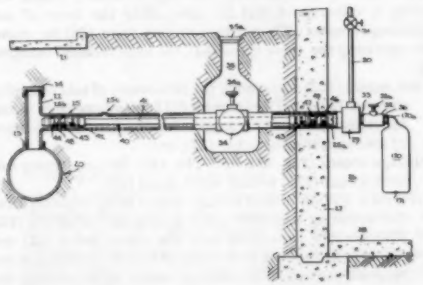
METHOD OF INSTALLING AN INTERIOR BY-PASS LINER

Bernard A. Di Giovanni, 96 Davis Ave., Hauppauge, N.Y. 11787, and Francisco J. Ciminiello, 21 Victor La., Woodbury, Long Island, N.Y. 11797

Division of Ser. No. 204,629, Nov. 6, 1980, Pat. No. 4,377,945, which is a continuation of Ser. No. 955,990, Oct. 30, 1978, abandoned. This application Sep. 24, 1982, Ser. No. 422,836

Int. Cl.³ F16L *55/16*

U.S. Cl. 138—97 **3 Claims**



1. A method of installing an interior by-pass liner tube within a conduit comprising the steps of attaching a substantially cylindrical adapter to, and forming a continuation of, each end of said liner tube, each said adapter having a longitudinally spaced-apart pair of peripherally extending and exteriorly mounted radially expandable sealing gaskets thereon, inserting said liner tube within said conduit and, when each of said liner tube end adapters is in its intended position within said conduit, expanding said gasket pair on each adapter radially into sealing engagement with the surrounding interior surfaces of said conduit while providing a gas leakage passage having an interior end terminus within said cylindrical adapter and an exterior end terminus on the exterior of said adapter within the region between said pair of gaskets thereon, whereby said interior by-pass liner tube is installed substantially permanently within said conduit by said sealing engagement of said gasket pairs at each of its ends with said conduit interior surfaces, and the interior of said liner tube has gas leakage communication with the respective interior surface portions of said conduit and the peripheries of said gaskets between each of said gasket pairs.

4,427,032

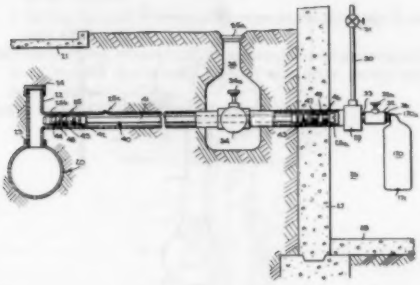
SERVICE LINE INTERIOR BY-PASS

Bernard A. Di Giovanni, 96 Davis Ave., Hauppauge, N.Y. 11787, and Francisco J. Ciminiello, 21 Victor La., Woodbury, L.I., N.Y. 11797

Division of Ser. No. 181,671, Aug. 27, 1980, which is a division of Ser. No. 955,990, Oct. 30, 1978, abandoned. This application Sep. 24, 1982, Ser. No. 422,837

Int. Cl.³ F16L 55/16

U.S. Cl. 138—98 10 Claims



1. An interior by-pass assembly within, and normally providing an unobstructed fluid by-pass passageway through, at least a portion of the length of a service pipeline having a service end and an opposite end, comprising a length of tubing disposed within and along said length of the pipeline, a pair of longitudinally spaced-apart exterior sealing gaskets mounted substantially on and adjacent to each end of said tubing, each of said gaskets in each said pair engaging the interior wall of said pipeline so as to provide respective longitudinally spaced-apart fluid-tight peripheral seals between said tubing and said pipeline interior wall, and means defining respective fluid leakage passages extending from substantially the interior of said tubing to the respective spaces between each of said gasket pairs and against the pipeline interior wall portion therebetween, whereby fluid pressure applied within said tubing will be transmitted to and along the respective sealing peripheries of said gaskets.

4,427,033

BENDING STRAIN RELIEF WITH ADJUSTABLE STIFFNESS

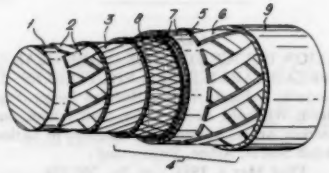
Sigmund Ege, Oslo, Norway, assignor to International Standard Electric Corporation, New York, N.Y.

Filed Dec. 15, 1981, Ser. No. 331,093

Claims priority, application Norway, Dec. 22, 1980, 803895

Int. Cl.³ F16L 11/12

U.S. Cl. 138—103 11 Claims



1. A bending strain relief device having two operating modes, a first of said two modes rendering said device relatively stiff and a second of said two modes rendering said device relatively flexible for use with a conduit, said device including

first and second sets of helically formed stiffening rods, said first set of rods surrounding said conduit and said second set of rods surrounding said first set of rods said rods of said first set of rods lightly engaging said rods of said second sets of rods;

an outer sheath surrounding and engaging said second set of rods;

at least one expandable body arranged between said conduit and said first set of rods and urging said rods of said first and second sets of rods into greater engagement with one another upon an increased expansion thereof; and

operating mode control means having pressure control means coupled to said expandable body to control expansion of and internal pressure of said expandable body to provide said two operating modes.

4,427,034

COATING COMPOSITION FOR PROTECTING INNER SURFACE OF TUBES IN HEAT EXCHANGERS

Koji Nagata; Shiro Sato, and Akio Ogiso, all of Nagoya, Japan, assignors to Sumitomo Light Metal Industries, Ltd., Tokyo, Japan

Division of Ser. No. 185,194, Sep. 8, 1980, abandoned. This application Aug. 27, 1981, Ser. No. 296,962

Claims priority, application Japan, May 23, 1980, 55-69324

Int. Cl.³ F16L 9/14

U.S. Cl. 138—145 7 Claims

1. A heat exchanger tube having a small diameter in the order of 10–40 mm and a large length in the order of 3–40 m and provided on the inner surface with an artificial protective film less than 50μ in thickness, not more than 0.0001 $m^2h°C./Kcal$ in fouling factor and not less than 5000 Ω cm^2 in polarization resistance, said artificial protective film being formed by a spray coating of a coating composition prepared by adding at least one aminoalkoxysilane compound at a ratio of 0.1–5% by weight to a liquid coating composition including as a film-forming material at least one organic polymer resin selected from a group consisting of alkyd resin polyurethane resin, epoxy resin, and acrylic resin.

4,427,035

CLUTCH ARRANGEMENT FOR A HEDDLE OF A WEAVING MACHINE

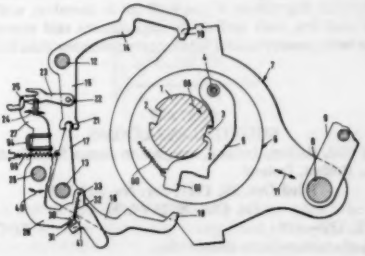
Otto Hintsch, and Werner Julich, both of Wallisellen, Switzerland, assignors to Sulzer Brothers Limited, Winterthur, Switzerland

Filed Sep. 15, 1981, Ser. No. 302,663

Claims priority, application European Pat. Off., Sep. 19, 1980, 80105632

Int. Cl.³ F16D 11/06; D03C 1/00

U.S. Cl. 139—76 4 Claims



1. A clutch arrangement for controlling a heddle of a power loom, said arrangement comprising

an intermittently rotatable drive shaft having at least one slot therein;

an eccentric rotatably mounted on said shaft for driving a heddle;

a pawl mounted on said eccentric for engagement in said slot of said shaft;
at least one control lever movable between a blocking position in the path of said pawl and a release position spaced from said pawl;
a stroke meter drive for moving said lever between said positions;
a stationary stop;
a spring biasing said control lever towards said stop in said blocking position; and
an auxiliary spring biasing said control lever against said stop in said blocking position.

4,427,036

WEFT GUIDE DEVICE IN A JET LOOM

Kazunori Yoshida, Nagoya, and Hiroshi Arakawa, Kariya, both of Japan, assignors to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho, Kariya, Japan

Filed Nov. 24, 1981, Ser. No. 324,610
Claims priority, application Japan, Nov. 29, 1980, 55-168975
Int. Cl.³ D03D *47/30*
U.S. Cl. 139—435 **8 Claims**

1. A weft guide device in a jet loom having a reed carrier for carrying a reed thereon, said device comprising an array of substantially vertically disposed and adjacently aligned weft guide members mounted on said reed carrier along the reed, each of said weft guide members having substantially conjoining and straight interiorly facing surfaces including at least an upper wall surface, a fore wall surface, and a lower wall surface, providing a weft guide opening which, together with said weft guide openings of said other aligned weft guide members, provides a weft guide path, and an air discharge member disposed substantially within said guide member array and laterally adjacent to one of said weft guide members on the side thereof which is opposite to said fore wall surface thereof, to discharge air obliquely into said weft guide path and towards said fore wall surfaces, said fore wall surface of each said weft guide member being inclined to the vertical with reference to said vertical disposition of the weft guide member, with that end of said fore wall surface which conjoins said upper wall surface being nearer to said air discharge member than its other end.

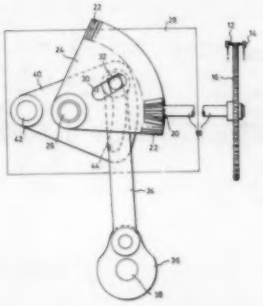
4,427,037

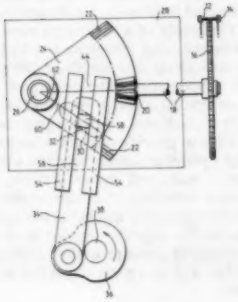
SHUTTLELESS LOOMS

Ashley Hill, Belfast, Ireland, assignor to James Mackie & Sons Ltd., Belfast, Ireland

Filed Oct. 16, 1981, Ser. No. 312,353
Int. Cl.³ D03D *47/00*
U.S. Cl. 139—449 **51 Claims**

1. A shuttleless loom comprising
a frame,
at least one weft carrier supported on said frame, and
a drive mechanism supported by said frame to drive said weft carrier, said drive mechanism comprising
a connecting rod,
means connected to said rod at its driven end to drive said rod in a reciprocating path,
a drive member connected to said weft carrier, said drive member being pivotally connected to said frame, and said drive member being pivotally connected to said rod at said rod's non-driven end to pivot said drive member during reciprocation of said rod, and
a guide member which defines a guide path, said guide member being slidably connected to said rod at said rod's non-driven end so that said slidable connection follows said guide path during reciprocation of said rod,





said rod, drive member and guide member all being movable relative one to another during each loom cycle, and said guide member functioning to vary that distance between the pivot connection of said rod to said drive member and the pivot axis of said drive member relative to said frame during each loom cycle, the speed of the drive transmitted by said drive mechanism to said weft carrier being varied also in response to the variation in said distance.

4,427,038

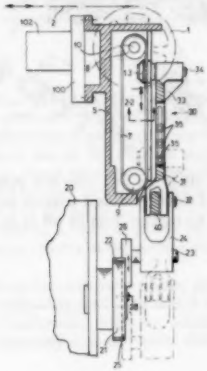
ACTUATION DEVICE FOR THE DRIVE GEAR OF A WEFT THREAD CARRIER OF A SHUTTLELESS LOOM

Gerhard Oesterle, Koblach, Austria; Rudolph Jaeger, Frasnacht, Switzerland; Willibald Auer, Arbon, Switzerland, and Hermann Unfried, Arbon, Switzerland, assignors to Aktiengesellschaft Adolf Saurer, Arbon, Switzerland

Filed May 4, 1981, Ser. No. 260,339
Claims priority, application Switzerland, May 21, 1980, 3947/80
Int. Cl.³ D03D *47/00*
U.S. Cl. 139—449 **9 Claims**

1. An actuation device for a drive element of a weft thread carrier of a shuttleless loom which is guided by a gripper tape, comprising:
a crank drive;

a substantially slipless traction means-drive containing a toothed belt;
a drive element operatively connected with the crank drive by means of the toothed belt of said substantially slipless traction means-drive;
a linearly guided slide operatively connected for movement with the toothed belt;
said crank drive moving said linearly guided slide back-and-forth;
said traction-means drive further comprising:
a drive pulley operatively connected for rotation with the drive element;
a tensioning pulley arranged in spaced relationship from said drive pulley;
said toothed belt of said traction means-drive being wrapped in an endless configuration about said drive pulley and said tensioning pulley;
guide means provided for said slide;



at least one run of said toothed belt extending essentially parallel to said guide means for said slide;
said slide being fixedly connected with said one run of said toothed belt;
the length of said one run essentially corresponding to the greatest spacing of reversal points of the slide and which govern the maximum insertion depth of the weft thread carrier into a shed of the loom;
means for adjusting the spacing of the reversal points of the slide;
box means open towards the side of the slide;
said box means having side walls forming said guide means for said slide;
said box means being connected with a sley of the loom in the form of a sley sword; and
said traction means-drive being located within said open box means.

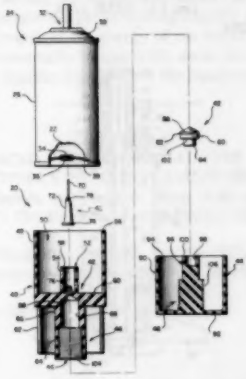
4,427,039

MECHANICAL DELIVERY SYSTEM FOR A CATALYST OR THE LIKE

William R. Brooks, 260 Arlington, Elmhurst, Ill. 60126, and Irving C. Heinzel, 45 Brookdale La., Palatine, Ill. 60067

Filed Dec. 14, 1981, Ser. No. 330,574
Int. Cl.³ B65B *3/04*
U.S. Cl. 141—20 **12 Claims**

1. Apparatus for injecting a product ingredient into a pre-filled product container having superatmospheric internal pressure and having an aperture sealed with a resilient, pierceable gasket, said apparatus comprising: a coupling member including cavity means for snugly receiving a portion of the container body to establish a datum aligned with said pierceable gasekt, said coupling member further including mounting means for positioning a syringe assembly; a syringe assembly including a tubular barrel mounted on said mounting means and defining an internal chamber for containing a metered quantity of a liquid product ingredient, said syringe assembly further including a cannulated needle fastened to said tubular barrel in fluid-transfer relationship with said product ingredient chamber and alignable confronting the pierceable gasket, and a movable piston in said barrel; a wrench member assemblable with said coupling member and including actuator means for selectively engaging said piston in reducing the



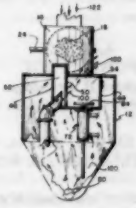
internal volume of said product ingredient chamber; and progressively engagable, force-multiplying means acting between said coupling member and said wrench member for cooperating in support of said syringe assembly upon advance of said needle into piercing engagement with said gasket and for urging said actuator means into operative engagement with said piston to express the contents of said ingredient chamber through said needle and into said product container against the internal backpressure thereof.

4,427,040

REVERSE FLOW POP-OFF AIR CONTROL

Murland L. Taylor, 5300 Main, Parsons, Kans. 67357

Filed Mar. 12, 1979, Ser. No. 19,757
Int. Cl.³ B65B *1/04*
U.S. Cl. 141—67 **9 Claims**



1. In a pneumatic valve bag packer of the class wherein material and air flow into a bag being filled through a filling spout from the interior of an air pressurized hopper containing the material, and wherein flow curtailing means are provided for curtailing the flow of material through the discharge end of the spout upon completion of the filling of a bag and its removal from the discharge end of the spout; the improvement comprising said flow curtailing means comprising an air flow control means for causing a reversed flow of air in the spout sufficient to stop discharge of material through the dischage end of the spout, said air flow control means comprising means

for withdrawing sufficient air from the hopper to result in a subatmospheric air pressure therein, and a reversed flow of air in the spout.

4,427,041

DISPENSING AND METERING DEVICES FOR LIQUIDS

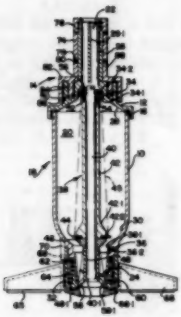
John C. Coetzee, P.O. Box 12081, Jacobs, 4026, South Africa

Filed Aug. 11, 1981, Ser. No. 291,957

Claims priority, application South Africa, Aug. 12, 1980, 80/4918; Mar. 25, 1981, 81/2010

Int. Cl.³ B65B *3/06*

U.S. Cl. 141—294 **17 Claims**



17. A dispensing and metering device comprising attachment means to secure the device to a container, a housing defining a chamber and having an inlet and an outlet so that the chamber can be filled through the inlet with liquid from a container secured to the device by the attachment means and can be drained through the outlet, valve means movable from a first condition in which it isolates the chamber from the outlet and opens the inlet to a second condition in which it closes the inlet and allows liquid to flow from the chamber to the outlet, and an air bleed hole for introducing air into the chamber to replace liquid flowing from the outlet when the valve means is moved to the second condition, wherein the attachment means of the device comprises a resiliently deformable sleeve located around an inlet throat and locatable in a bottle neck, and a stop and a shoulder movable one toward another to compress the sleeve between them and to cause radial expansion of the sleeve, whereby the sleeve can be expanded radially into engagement with the interior of a bottle neck to attach the device to the bottle neck.

4,427,042

POWER TOOL

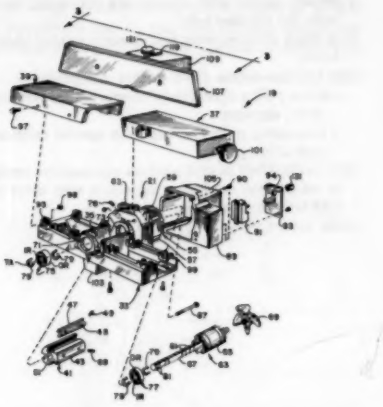
Richard L. Mitchell; Richard B. Brundage, and John A. Palmer, all of St. Louis County, Mo., assignors to Emerson Electric Co., St. Louis, Mo.

Filed May 13, 1981, Ser. No. 263,122

Int. Cl.³ B27C *1/14, 9/04*

U.S. Cl. 144—1 R **17 Claims**

13. A combination power tool assembly including a support stand, a first power tool mounted on said stand having a respective dedicated electric motor for driving said first power tool, a second power tool mounted on said stand having a respective dedicated electric motor for driving said second power tool, each of said motors having a respective power cord, and a selector switch having a power supply cord connected thereto which is adapted to be plugged into a source of electrical power, each of said motor power cords being connected to said selector switch, the latter having switch means selectively movable from an off positon in which both of said motors are de-energized to a first operable position in which said first power tool motor is energized and in which said second power tool motor is de-energized or to a second operable position in which said second power tool motor is energized and in which said first power tool motor is de-energized, and means cooperable with said switch means which when in a first position enables said switch means to be selectively



moved from its off to its first operable position, and which when in a second position in said selector switch enables said switch means to be moved from its off to its second operable position.

4,427,043

CORD BURYING APPARATUS FOR VENEER LATHE

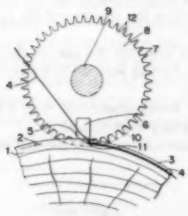
Katsuji Hasegawa, Ohbu, Japan, assignor to Meinan Machinery Works, Inc., Aichi, Japan

Filed Mar. 6, 1981, Ser. No. 241,132

Claims priority, application Japan, Mar. 23, 1980, 55-37926

Int. Cl.³ B27C *5/02*

U.S. Cl. 144—209 R **3 Claims**



1. A cord burying apparatus for a veneer lathe comprising:

a cord burying knife having a cutting edge of suitable shape and a cord outlet at one end thereof, said knife being attached on a veneer lathe to come into cutting engagement with a log turned on the veneer lathe to a predetermined depth; and

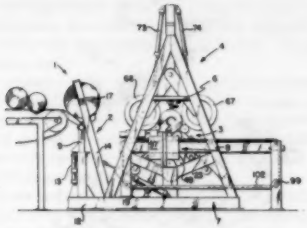
a piercing element placed on at least one side of said cord burying knife in axial juxtaposition therewith relative to the log and having a plurality of piercing members mounted thereon in a row which intersect an axial direction of the log, said piercing member having means thereon being adapted to pierce the log deeper than the knife.

4,427,044

LOG CENTERING DEVICE

Irving L. Plough, Snohomish; David B. Puryear, Enumclaw, both of Wash., and Charles R. Turner, Albany, Oreg., assignors to Pigott Enterprises, Bellevue, Wash.

Filed Jun. 30, 1981, Ser. No. 279,066
Int. Cl.[3] B27B *1/00*; B27L *5/02*
U.S. Cl. 144—356 35 Claims



1. An apparatus for locating the center axis of the largest solid of rotation obtainable from an irregular elongated body according to predetermined processing standards comprising;

rotational support means for rotating said body in such a manner as to allow displacement of the opposite ends thereof during rotation so as to reflect the non-cylindrical characteristics of the body,

means for generating a locus of points for each end face of the body representative of the motion thereof relative to a datum,

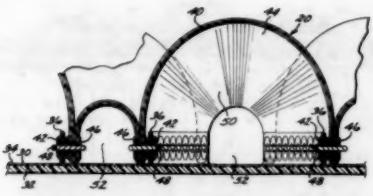
means for defining for each locus a point generally central to the points comprising the locus, which point bears a predetermined relationship with the points comprising the locus, said centrally located points defining said center axis.

4,427,045

SURGE DAMPENING BAFFLE FOR LIQUID STORAGE TANKS

Richard T. Headrick, 5200 Irvine Blvd., #24, Irvine, Calif. 92714

Continuation of Ser. No. 211,061, Nov. 28, 1980, abandoned.
This application Oct. 22, 1982, Ser. No. 435,934
Int. Cl.[3] B65D *90/52*
U.S. Cl. 150—55 10 Claims



1. An improved apparatus for storing liquid comprising: a flexible and collapsible tank adapted to contain liquid therein and a plurality of elongated pockets secured to the interior surface of the tank, said pockets, when the tank is collapsed, being in a collapsed state and, when the tank is filled with liquid but at rest, being also in a collapsed state,

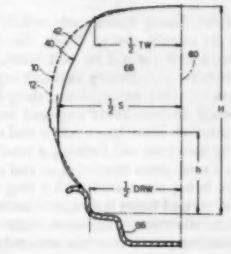
the improvement comprising said pockets, being made of a flexible material having a memory for retaining its shape so that the pockets in the tank are configured in a predetermined substantially permanent shape, said substantially permanent shape of the pockets being substantially distorted only when the tank is collapsed upon the pockets due to withdrawal of liquid from the tank, the pockets being arranged along a line extending transversely of a line along which surges in the liquid contained in the tank move, the pockets having their elongate extents aligned with the line of surge action, each pocket having an enlarged open end and a restriction spaced from the enlarged open end at an opposite end of the pocket, adjacent pockets having their respective open ends and the restrictions arranged to face in opposite directions along the line of surge action, due to the substantially permanent shape of the pockets the pockets being capable of absorbing at least a portion of the energy of the liquid flowing in the surge substantially immediately upon occurrence of the surge to transfer energy from the liquid to the tank.

4,427,046

ADVANCED PROFILE RADIAL TIRE HAVING RELATIVELY HIGH INFLATION PRESSURE

Manuel G. Balbis, and Colin V. King, both of Rome, Italy, assignors to The Firestone Tire & Rubber Company, Akron, Ohio

Filed Mar. 11, 1982, Ser. No. 357,250
Claims priority, application Italy, Apr. 29, 1981, 67577 A/81
Int. Cl.[3] B60C *3/00*
U.S. Cl. 152—209 R 6 Claims



1. In an inflated tire and rim assembly wherein the tire includes a tread portion, a tread reinforcement in the tread portion, a pair of sidewalls respectively on opposite sides of said tread portion, a pair of bead portions respectively at the inner edges of said sidewalls, a lower sidewall reinforcement adjacent each of said bead portions and sidewall inner edges, a bead reinforcement in each of said bead portions, and a radial carcass reinforcement extending from one bead portion to the other, the improvement being in the profile of said tire characterized in:

a. the tire having a section height H and a section width S, the aspect ratio (H/S) being in the range from about 0.80 to about 0.90;

b. the maximum section width (S) being located at a height (h) of less than 45 percent of said section height (H), with the design width (DRW) of said rim being about 75 percent of said section width (S);

c. the width (TW) of said tread portion being less than 75 percent of said section width (S);

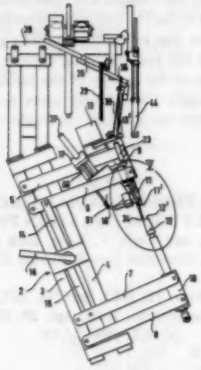
d. the inflation pressure of said tire being a minimum of about 25 percent greater than the inflation pressure of a conventional profile tire of equivalent size, said assembly being operable at said greater inflation pressure at about the same load capacity and at about the same tire deflection as a conventional profile tire while having acceptable ride comfort characteristics; and

e. said lower sidewall reinforcement providing relative stiffness in its area of location.

4,427,047
MACHINE FOR FITTING SPOKES INTO WHEEL HUBS

Bernard Guillermier, Epagny, France, assignor to Bg Technic (Sarl), Pringy, France

Filed Nov. 12, 1981, Ser. No. 320,495
Claims priority, application France, Nov. 19, 1980, 80 24529
Int. Cl.³ B21K *1/34*
U.S. Cl. 157—1.5 6 Claims



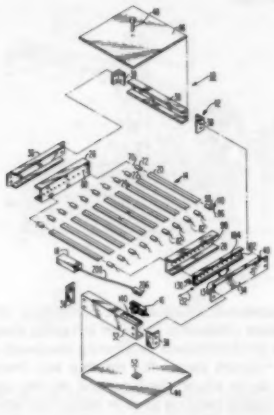
1. In a machine for fitting spokes into wheel hubs, each wheel hub having 2n evenly spaced holes, the combination comprising, a frame, a post carried by said frame, first means supported by said post for maintaining said hub in a position in which its axis forms an acute angle of less than 30° with the vertical, second means cooperatively engaged with said first means for rotating said hub about its axis, first and second tubes adjustably carried by said post and forming a small angle with the axis of said hub, a nose-piece carried at an end of each tube, each said nose-piece being associated with a ring of said hub, third means coupled to said tubes for reciprocating said nose-pieces in the vertical direction, said nose-pieces being positioned in a low position just above the associated rings for supplying the holes, fourth means supported by said frame and positioned to supply a spoke to each tube when said nose-pieces are in their low position, so that said spokes descend under the effect of gravity into said tubes with their flattened part in an upward position, control means connected to said first, second, third and fourth means so that said hub is rotated in a selected direction and makes a revolution during which said nose-pieces are moved downwardly n times, and so that, after each downward movement of said nose-pieces, a spoke is fed into each tube, said nose-pieces being lowered every $(2\pi/n)$ and only being raised again after having passed, each one, over at least one hole and after a spoke has fallen under the effect of gravity into the first hole met by each of said nose-pieces, and means carried by said frame for handling said hub so as to take said hub after the first pass and place it, after turning it over, in a position where the remianing holes will be provided with spokes during a second pass.

4,427,048
SHUTTER CONSTRUCTION

Susumu Osaka, and Minoru Toda, both of Machida, Japan, assignors to RCA Corporation, New York, N.Y.

Filed Feb. 5, 1981, Ser. No. 231,858
Claims priority, application United Kingdom, Sep. 2, 1980, 8028238
Int. Cl.³ E06B *7/086*
U.S. Cl. 160—107 10 Claims

1. A shutter construction comprising:
a transparent housing;
a louvre assembly adapted to be enclosed within said housing, said assembly comprising a plurality of lightweight foil louvres each rotatably supported at its end along parallel axes with first and second bearing pins;
a crank drive member attached to one pin of each louvre for rotating said one pins and said louvres in unison about said parallel axes, said crank drive member and louvres having a combined mass center offset from said axes;

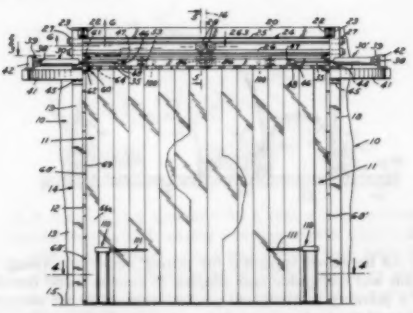


counterbalance means coupled to said drive member for counterbalancing said offset mass center with respect to said axes; and
drive means releasably secured to said housing and coupled to said crank drive member for moving said crank drive member in a direction normal to said axes.

4,427,049
POWER OPERATED BI-FOLD STRIP CURTAIN DOOR ASSEMBLY

James A. Belanger, Northville; Robert J. Wentworth, Ann Arbor; Douglas J. Calvin, Livonia, and James M. Lapham, Northville, all of Mich., assignors to Belanger, Inc., Northville, Mich.

Filed Dec. 3, 1980, Ser. No. 212,372
Int. Cl.³ E05D *15/26*
U.S. Cl. 160—199 6 Claims



1. A strip curtain bi-fold door assembly adapted for use in a door space defined by an overhead track, a floor and a pair of spaced apart uprights, said door assembly comprising:
at least a pair of laterally positioned inboard and outboard door means having opposed adjacent ends and free ends for closing at least a part of the door space, each said door

means including support means for suspending a group of elongated flexible strip curtains in overlapping relation;

first hinge means for connecting the opposed adjacent ends of said door means;

second hinge means adapted to connect the free end of the outboard door means to one of the uprights;

carriage means adapted to guidingly engage the track for travel therealong;

said carriage means including pivot pin means adapted for suspending the inboard door means adjacent its free end for pivotal movement during travel of said carriage means; and

fluid actuator means adapted to be interconnected between one of said door means and said one upright and effective when actuated to move said door means and their associated group of strip curtains between a folded position adjacent said one upright and an extended side-by-side position across the door space;

said fluid actuator means being in the form of a piston and cylinder having one end pivotally connected to said one upright and an extensible and retractable piston rod extending from said cylinder other end with the rod pivotally connected to said outboard door means;

said outboard and inboard door means having terminal interior strip curtains at their opposed adjacent ends, one of said door means having a terminal exterior strip curtain vertical border portion extending laterally a predetermined distance beyond the associated opposed adjacent end of said one door means;

means reinforcing the upper horizontal edge of said terminal exterior strip curtain such that its border portion is maintained in the plane of an associated group of exterior strip curtains overlapping said interior strip curtains, whereby upon said door means being extended said terminal exterior strip curtain border portion overlapping the next adjacent terminal interior strip curtain of the other door means such that a lap seal is provided at the juncture of said outboard and inboard groups of curtain strips; and

said door means in their folded position having a V-shaped configuration with first interior surface of said door means facing inwardly in opposed relation; and second exterior surfaces of said door means facing outwardly;

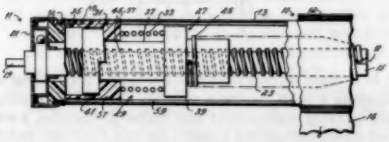
the axis of said fluid actuator means disposed substantially normal to said outboard section exterior surface in its folded position, such that during the initial extension of said piston rod, the mechanical advantage of said actuator means in transmitting force from said piston rod to said outboard section is at a maximum.

4,427,050

WINDOW SHADE CLUTCH ASSEMBLY

John D. Toppen, Cincinnati, Ohio, assignor to Clopay Corporation, Cincinnati, Ohio

Filed Jul. 26, 1982, Ser. No. 401,832
Int. Cl.³ E06B 9/20
U.S. Cl. 160—315 **12 Claims**



1. A tube assembly for preventing over-tensioning of a spring motor means in a window shade comprising:

a fixed shaft;

a housing rotatable relative to said fixed shaft;

spring motor means contained within said housing, said spring motor means being connected to said fixed shaft;

spool means axially movable along said fixed shaft, said spool means being connected at one end to said spring motor means;

cup means rotatable with said housing; and

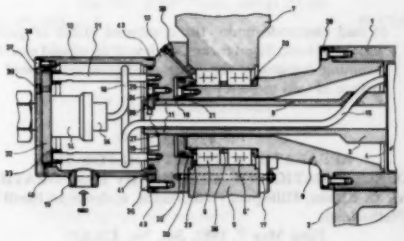
clutch means interconnecting said spool means and said cup means, said spool means being movable in a first axial direction along said shaft while rotating with said housing to effect increased tensioning of said spring motor means, said clutch means being operable to drivingly disengage said spool means from said cup means at a predetermined point of axial movement of said spool means in said first direction so as to prevent further tensioning of said spring motor means.

4,427,051

TUBULAR ROLL FOR CONTINUOUS METAL CASTING MACHINES

Jacques Michelet, Metz, France, assignor to Institut de Recherches de la Siderurgie Francaise, Saint-German-En-Laye, France

Filed Jun. 15, 1981, Ser. No. 275,516
Claims priority, application France, Jun. 27, 1980, 80 14487
Int. Cl.³ B22D 11/12
U.S. Cl. 164—448 **7 Claims**



1. In combination with a continuous metal casting machine having a frame, a tubular roll for guiding a continuous metal billet emanating from said machine comprising a central arbor; a cylindrical envelop surrounding a central portion of said arbor radially spaced therefrom and rotatable about its axis by contact with a billet emanating from the machine; a pair of tubular spindles respectively fixed to opposite ends of said envelop coaxial therewith; a pair of ball bearings mounted in the machine frame and rotatably supporting said spindles; a pair of support cradles fixedly connected to the machine frame, said central arbor having a pair of opposite tubular end portions extending with radial clearance through said spindles and projecting beyond the latter to be supported by said cradles; means in one of said cradles for preventing rotation of said central arbor; and an electromagnetic polyphase inductor arranged in said envelope on the central portion of said arbor to produce magnetic stirring in the billet when activated.

4,427,052

METHOD OF ROTARY REFINING AND CASTING

Marvin Garfinkle, 943 E. McPherson St., Philadelphia, Pa. 19150

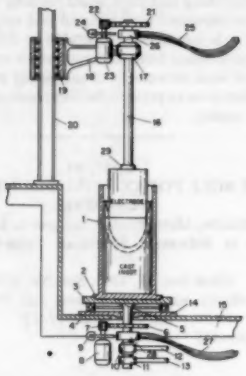
Filed May 7, 1982, Ser. No. 376,038
Int. Cl.³ B22D 27/02
U.S. Cl. 164—495 **8 Claims**

1. A method of alloy refining and casting wherein an electrode of the nominal composition of the ingot to be cast is vertically and rotatably suspended over a fluid-cooled mold within which said ingot is cast, said mold rotatably supported so that the axis of rotation of said mold and said electrode are coincidental;

heating the top of said ingot to above its melting point so as to form a molten pool whose free surface assumes the configuration of a paraboloid of revolution about said axis

of rotation under the combined effect of gravitational and centrifugal forces;

and heating the tip of said electrode to above its melting point so as to form droplets that diverge from the surface



of said electrode under the combined effect of gravitational and centrifugal forces, with said tip of said electrode assuming essentially the same configuration as said free surface of said molten pool.

4,427,053

APPARATUS AND METHOD FOR THE CONCENTRATION OF A LIQUID BY EVAPORATION

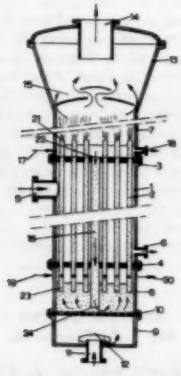
Dick G. Klaren, Hillegom, Netherlands, assignor to Esmil BV, Netherlands

Filed May 7, 1982, Ser. No. 376,025

Claims priority, application Netherlands, May 12, 1981, 8102307

Int. Cl.³ F28D *13/00*

U.S. Cl. 165—1 **11 Claims**



1. Apparatus for the concentration of a liquid by evaporation comprising

(a) a heat exchanger having a plurality of upwardly extending riser tubes for flow of the liquid being treated, which tubes have open upper and lower ends and in use are contacted by a relatively hot medium for heat transfer to the liquid being treated,

(b) upper and lower chambers respectively above and below the heat exchanger, the riser tubes opening at respectively their upper and lower ends into said upper and lower chambers, the upper chamber having a base and the riser tubes extending above that base,

(c) a granular mass which is fluidizable in use by the flow of the liquid being treated so as to occupy at least the said riser tubes,

(d) means for vapour collection and discharge from the upper chamber,

(e) at least one return conduit for passage of the liquid being treated and the granular mass from the upper chamber to the lower chamber, which return conduit is connected into the upper and lower chambers in each case at a lower level than the opening of the riser tubes into the respective chamber, and

(f) supply and discharge connections for the liquid being teated located at levels lower than the opening of the riser tubes into the upper chamber.

11. A method for concentrating liquid by evaporation comprising

a. passing said liquid in contact with a fluidizable granular mass upwardly through a heat exchanger having a plurality of upwardly extending riser tubes for flow of the liquid being treated into a chamber above the heat exchanger, said tubes having open upper and lower ends; said tubes opening into said upper chamber and a lower chamber positioned below said heat exchanger, said granular mass being sufficient in quantity to occupy at least the inner tubes;

b. contacting the exterior of the tubes in the heat exchanger by a relatively hot medium for heat transfer to the liquid being treated to effect heat transfer at a rate such that the riser tubes function as a rising film evaporator for the liquid being treated;

c. collecting and discharging vapor from the upper chamber; and

d. returning unvaporized liquid and the granular mass from the upper chamber to said lower chamber at a level lower than the opening of the riser tubes for recycling.

4,427,054

ROTARY REGENERATIVE HEAT EXCHANGER AND METHOD OF OPERATING SAME

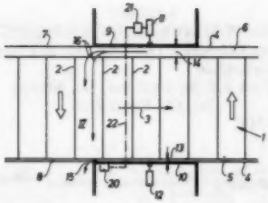
Kurt Karlsson, Tyresö, Sweden, assignor to Svenska Rotor Maskiner Aktiebolag, Stockholm, Sweden

Filed Sep. 9, 1982, Ser. No. 416,314

Claims priority, application Sweden, Sep. 9, 1981, 8105371

Int. Cl.³ F28D *19/00*

U.S. Cl. 165—1 **2 Claims**



2. In a rotary regenerative heat exchanger for gaseous media comprising a rotor having a plurality of sector-like compartments carrying regenerative heat exchange material, a stationary structure comprising a casing for said rotor and end plates having inlet and outlet openings separated by first and second adjustable sector plates providing two passages through said heat exchanger between said openings for flow in countercurrent direction of a primary gaseous medium to be heated and a secondary gaseous medium to be cooled of different pressure than said primary medium, respectively,

a method of at least reducing leakage of the gaseous medium having the lower pressure, trapped in the sector-like com-

partments, to the gaseous medium having the higher pressure, said method comprising:

adjusting said first adjustable sector plate (9) which is positioned between the inlet opening (7) of the low pressure medium and the outlet opening (6) of the high pressure medium to such an axial clearance (14) with respect to the corresponding end of the rotor that an intentional amount of direct leakage (16) of the high pressure medium is maintained between the rotor end and said first adjustable sector plate (9), thereby forcing out the low pressure medium from each compartment (17) that is about to leave the low pressure medium passage and replacing it with high pressure medium;

positioning a pressure medium tracing device (20) close to the outlet opening (8) of the low pressure medium flow and the portion of the second sector plate (10) where the sector-like compartments (17) move towards the high pressure medium flow; and

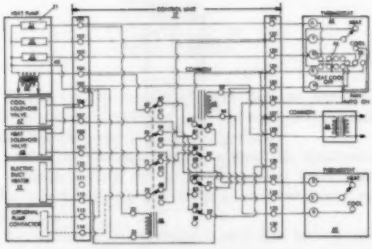
controlling said adjusting of said first adjustable sector plate by said low pressure medium tracing device (20) such that said clearance (14) is increased/decreased when presence or absence, respectively, of said low pressure medium is indicated by said low pressure medium tracing device (20).

4,427,055

HEATING AND COOLING SYSTEM USING GROUND WATER

Michael G. Heavener, Gaithersburg, Md., assignor to Memtel Corporation, Gaithersburg, Md.

Filed Oct. 8, 1980, Ser. No. 195,089
Int. Cl.³ F25B *13/00, 29/00;* **F25D** *17/00*
U.S. Cl. 165—29 **6 Claims**



1. A forced air heating and cooling system consisting essentially of:

(a) primary heating means comprising a ground water source heat pump operating in a heating mode;

(b) secondary heating means comprising a resistance heater;

(c) primary cooling means comprising a ground water-to-air heat exchanger operating in a cooling mode;

(d) secondary cooling means comprising said ground water source heat pump operating in a cooling mode;

(e) thermostat control means for controlling said primary and secondary heating means, said control means being;

(i) responsive to sensed temperature below a first predetermined temperature for energizing said heat pump in said heating mode while inhibiting said secondary heating means and said primary cooling means;

(ii) responsive to sensed temperatures below a second predetermined temperature which is below said first predetermined temperature for energizing said primary and secondary heating means while inhibiting said primary cooling means;

(iii) responsive to sensed temperatures above a third predetermined temperature which is at least as high as said first predetermined temperature for operating said primary cooling mean while inhibting said primary and secondary heating means; and

(iv) responsive to sensed temperatures above a fourth predetermined temperature which is above said third predetermined temperature for operating said primary cooling means and said secondary cooling means while inhibiting said secondary heating means;

(f) first and second water control valves controlled by said thermostat control means;

(g) means for delivering ground water to said water control valves;

(h) first conduit means for conducting water from said first valve, when open, through said water-to-air heat exchanger and then to said heat pump;

(i) second conduit means for conducting water from said second valve, when open, through said heat pump without passing through said water-to-air heat exchanger; and

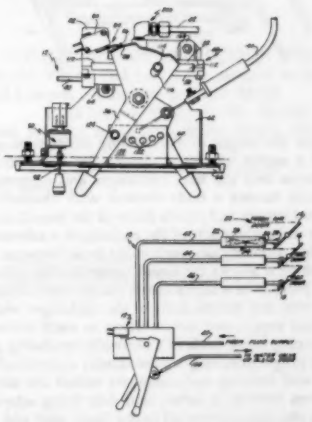
(j) flow return means for returning water passing through said heat pump back to said ground water supply.

4,427,056

AIR ACTUATED VEHICLE TEMPERATURE CONTROL SYSTEM

Thomas J. Johnson, Rockford, and Garth L. Thomas, Oregon, both of Ill., assignors to Kysor Industrial Corporation, Cadillac, Mich.

Filed Nov. 20, 1980, Ser. No. 208,661
Int. Cl.³ F28F *27/00;* **B61D** *27/00*
U.S. Cl. 165—42 **29 Claims**



1. For use in a vehicle temperature control system including a plurality of door means for controlling the flow of air through said system in different system modes, a control assembly for selectively interconnecting a plurality of outlet passages with a source of pressurized air to actuate said door means, said assembly comprising:

a valve front member defining an inlet passage and a plurality of inlet cavities communicating with said inlet passage;

a valve back member secured to said front member and defining a plurality of outlet passages, said inlet cavities and outlet passages being arranged in opposed, paired relationship with each other, said valve front and back members further defining an open elongated slot-like cavity;

an elongated, generally planar valve element slidably disposed within said slot-like cavity and movable to a plurality of positions, said valve element defining an array of control passages opening through said element and positioned to permit air to pass from selected ones of said inlet cavities to opposed ones of said outlet passages in the plurality of positions of said valve element, and said valve element defining a plurality of bleed ports movable in

front of said outlet passages to bleed air from said outlet passages into said slot-like cavity; and

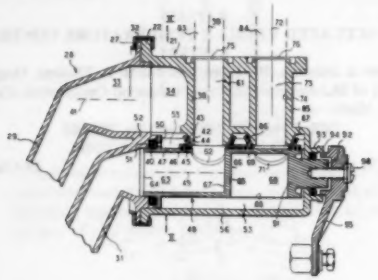
a plurality of seals, each disposed in one of said inlet cavities and outlet passages for sealingly engaging said valve element and preventing leakage of air out of said slot-like cavity to insure that air flows through said valve element control passages.

4,427,057

DEVICE FOR THE CONTROL OF THE LIQUID SUPPLY OF A HEAT EXCHANGER

Jean-Francois Bouvot, Le Mesnil Saint Denis, France, assignor to Valeo, Paris, France

Filed Jan. 22, 1981, Ser. No. 227,417
Claims priority, application France, Dec. 31, 1979, 79 32103
Int. Cl.³ F28F *27/02*
U.S. Cl. 165—103 **6 Claims**



1. In a heat exchanger of the heating installation of the passenger of a motor vehicle, a device for controlling the liquid circulation into the heat exchanger and comprising a cock, said cock having a body formed with channels connected to liquid supply and return ducts of the installation and to liquid inlet and outlet ducts of the exchanger, a substantially cylindrical plug rotatably mounted in the body between a first position in which it allows the liquid supply to the exchanger and a second position in which it closes the channels connected to the liquid inlet and return ducts of the exchanger and connects the liquid supply and return ducts to each other, said body and said plug being made of a thermally insulating plastic material, said plug comprising a substantially cylindrical skirt, a transverse wall forming two chambers within the skirt and separating them from each other, said skirt being adapted to close the said channels connected to the liquid inlet and outlet ducts of the exchanger when the plug is in its second position, said skirt having two openings merging each into a said chamber and adapted to communicate with the channels connected to the liquid inlet and outlet ducts of the exchanger when the plug is in its first position, and means forming a permanent communication between one of said chambers and one of said supply and return ducts, and between the other of said chambers and the other of said supply and return ducts.

4,427,058

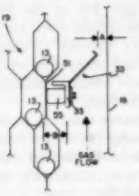
HRSG SIDEWALL BAFFLE

Frederic C. Bell, Sr., Newburyport; George T. Nicholson, Lynn; Russell L. Shade, Jr., Boxford, and David R. Skinner, Georgetown, all of Mass., assignors to General Electric Company, Lynn, Mass.

Filed Dec. 13, 1982, Ser. No. 449,448
Int. Cl.³ F22B *1/18, 37/68*; F28F *13/06*
U.S. Cl. 165—160 **9 Claims**

1. An improved heat exchanger of the type comprising a gas carrying duct including sidewalls and endwalls and having a tube bundle disposed therein; the tube bundle comprising a plurality of substantially horizontal and parallel fluid carrying tubes; at least one tube support sheet disposed toward each opposite end of the tube bundle supporting the fluid carrying tubes wherein the improvement comprises:

a first pair of baffles, one on each side of the tube bundle and extending along the length of the tube bundle, each baffle being attached to the tube bundle and extending outwardly towards its respective adjacent sidewall; and,



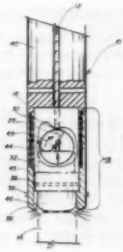
a second pair of baffles, one on each side of the tube bundle and extending along the length of the tube bundle, each baffle being attached to the tube bundle and extending outwardly towards its respective adjacent sidewall, said first baffles being downstream from said second baffles with respect to the duct gas flow direction.

4,427,059

WIRE LINE CUTTER APPARATUS

Eric J. Olivier, Rte. 2, Box 673, Schriever, La. 70395

Filed Dec. 30, 1981, Ser. No. 335,832
Int. Cl.³ E21B *29/04*
U.S. Cl. 166—54.6 **5 Claims**



1. A wire line cutter apparatus, comprising:

a. an elongated member having a longitudinally extending channel for placement of the wire line to be cut;

b. cutter means, comprising;

i. an upper housing portion;

ii. a notched blade member rotatably mounted to allow substantial rotation of said blade member in said upper housing portion which moves substantially from a vertical inoperative position to a horizontal operative position;

iii. a cutting edge on said notched blade member that faces substantially upwards when said blade member is in said vertical inoperative position;

iv. a lower actuating member slidably engaged with said upper housing portion to cause rotation of said blade member upon contact of said actuating member with a down hole tool;

c. means for receiving said cutter means in the lower end of said elongated member;

d. a stationery edge formed by said longitudinal channel in said lower cutter means and positioned in opposition to movement of said blade member so that rotation of said blade member from the vertical to the horizontal along a path intersecting said channel through which said wire

line is set, intersects said channel and wire line and crushes and severs said wire line between said cutting edge of said blade member and said stationery edge; and

e. a sheer pin engageable with said lower actuating member and said means for receiving said cutter means so that premature rotation of said blade member to said operative position by said lower actuating member is prevented.

4,427,060

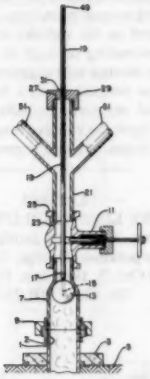
GAS WELL BALL RETRIEVER

Joseph G. Villers, Sr., 855 Treat Blvd., Tallmadge, Ohio 44278

Filed Aug. 31, 1981, Ser. No. 297,740

Int. Cl.³ E21B *33/068*

U.S. Cl. 166—85 **10 Claims**



1. A device for capturing a seal ball that has jammed in a wellhead of a gas well below a wellhead control valve and for safely venting gas trapped below comprising:

(a) a hollow tube having one end adapted for attachment to an exposed end of the wellhead control valve and the other end containing seal means to prevent escape of gas therefrom;

(b) a first shaft axially suspended in said tube, having one end thereof terminating outside said sealed end of said tube, said shaft adapted for rotary and reciprocal motion along the axis of said tube;

(c) means attached to said first shaft for passing through the open wellhead control valve and drilling into the jammed ball and temporarily capturing the ball to said shaft when said shaft is rotated and advanced toward the ball; and,

(d) a vent in said tube to permit the escaping gas to pass out of the well when the captured ball is lowered in the casing head.

4,427,061

UNIVERSAL DRIFT AND RETRIEVER

Richard J. Moore, 104 Bellehomme, Lafayette, La. 70506

Filed Sep. 18, 1981, Ser. No. 303,587

Int. Cl.³ E21B *47/08, 23/00*

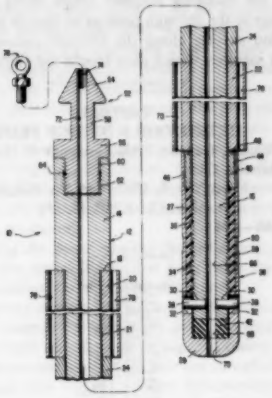
U.S. Cl. 166—113 **15 Claims**

1. A device for gauging the inside diameter of a pipe, comprising:

an elongated body;

a first bushing slidably received on said elongated body, said bushing being formed of a material substantially softer than the material of the pipe to be gauged, said bushing further having a substantially cylindrical outer surface for contacting the inner surface of the pipe to be gauged;

cap means for removably retaining said bushing on said body; and



resilient pad means contained within said cap means for absorbing shock.

4,427,062

POSITIONING OF DEFLECTION WEDGES

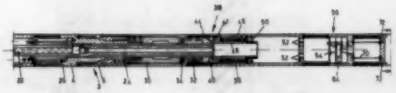
Timothy M. Tower, Oak Lawn, Ill., assignor to Boart International Limited, Johannesburg, South Africa

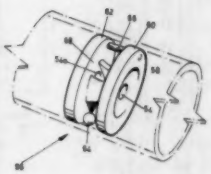
Filed Mar. 4, 1982, Ser. No. 354,796

Claims priority, application South Africa, Mar. 17, 1981, 81/1757

Int. Cl.³ E21B *43/00, 34/10*

U.S. Cl. 166—113 **10 Claims**





1. A device for positioning a deflection wedge in a drill hole which has a pronounced horizontal component, the device comprising:

an extension adapted to be secured to the end of a drill string so that at least a part of the extension is free to rotate relative to the drill string;

a pressure fluid operated rotation drive for rotating the rotatable part of the extension;

a deflection wedge detachably carried at the end of the extension; and

a wedge orientation unit in the rotatable part of the extension, which unit is adapted to stop operation of the rotation drive upon a preset angular orientation being achieved, the unit comprising a through passage for pressure fluid, a transverse passage intersecting the through

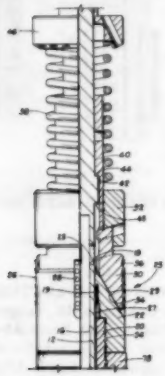
passage, and a blocking member movable in the transverse passage such that at a preset angular orientation of the unit, the blocking member drops along the transverse passage to the through passage so that, in use the pressure of fluid passing along the through passage entrains the block member which then blocks the through passage.

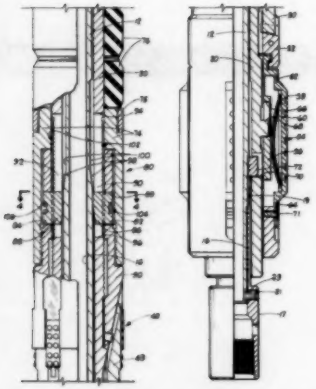
4,427,063

RETRIEVABLE BRIDGE PLUG

Neal G. Skinner, Duncan, Okla., assignor to Halliburton Company, Duncan, Okla.

Filed Nov. 9, 1981, Ser. No. 319,384
Int. Cl.³ E21B *33/134*
U.S. Cl. 166—134 **6 Claims**





6. In a retrievable bridge plug for plugging a well casing, said bridge plug of the type comprising:

a body;

a packer mandrel concentrically mounted on such a body, the packer mandrel including a plurality of horizontal grooves formed on a portion thereof and a plurality of longitudinal slots located in the grooved portion of the packer mandrel;

an elastomeric packer which is deformable to plug the casing responsive to longitudinal packer mandrel movement;

upper and lower anchor means for selectively anchoring the plug to the casing;

collar segments concentrically disposed about the packer mandrel, said segments being constrained from vertical movement with respect to said anchor means;

ratchet means mounted between said segments and the packer mandrel, said ratchet means permitting longitudinal packer mandrel movement in either direction when in a disengaged condition and restricting packer mandrel movement to movement in a packer-compressing direction when in an engaged condition, said ratchet means including a plurality of horizontal grooves formed on a portion of the radially-inward side of each segment which mate with the plurality of horizontal grooves formed on a portion of the packer mandrel; and

ratchet control means mounted between said body and said segments, said ratchet control menas engaging said ratchet means responsive to longitudinal body movement in one direction and disengaging said ratchet means responsive to longitudinal movement in the other direction, said ratchet control means including:

a tang mounted on the radially inward side of each segment and extending through its associated slot;

biasing means biasing said segments radially inward; and

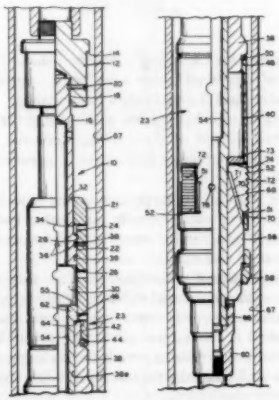
a cam portion formed in said body, said cam portion moving said segments radially inward and outward depending upon the relative longitudinal position of the body with respect to said segments.

4,427,064

WIRE LINE NO-BLOW TOOL

Michael L. Bowyer, Aberdeen, Scotland, assignor to Baker International Corporation, Orange, Calif.

Filed Oct. 2, 1981, Ser. No. 307,910
Int. Cl.³ E21B *23/00*
U.S. Cl. 166—217 **5 Claims**



1. A work string element for use in a subterranean well for gripping a well conduit in response to rapid axial movement of the portion of the work string depending from the element comprising: a plurality of relatively axially shiftable members including upper and lower inner members and a surrounding annular housing; upper connection means for securing the upper inner member to a wire line string; lower connection means for securing the lower inner member to a depending tool; means in said annular housing for limiting relative axial movements of both said inner members relative to said annular housing; whereby said lower inner member moves upwardly with respect to said annular housing through a limited axial stroke; radially shiftable slip means on said annular housing for gripping the well conduit when expanded outwardly; an upwardly facing surface on said inner member; a tubular slip actuating member slidably surrounding said lower inner member; said tubular slip actuating member having a downwardly

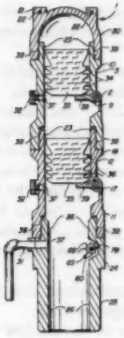
facing surface abuttable with said upwardly facing surface, whereby upward movement of said inner member moves said tubular slip actuating member upwardly to shift said slip means outwardly into engagement with the conduit in response to upward axial movement of said lower inner member, said inner members being abuttable within said housing to transmit downward jarring forces without moving said tubular slip actuating member; and shearable means between said annular housing and said upper inner member for preventing abutting contact of said upper and lower inner members.

4,427,065

CEMENTING PLUG CONTAINER AND METHOD OF USE THEREOF

James S. Watson, Longview, Tex., assignor to Razorback Oil Tools, Inc., Carthage, Tex.

Filed Jun. 23, 1981, Ser. No. 276,263
Int. Cl.³ E21B *33/16*
U.S. Cl. 166—250 **19 Claims**



1. A cementing plug container for cementing casing in a well comprising:

(a) a housing having a hollow interior and a connector means on one end for attachment to the well, and further including at least one conduit means for introducing cement into said hollow interior of said housing;

(b) at least one plug release means carried by said housing and further characterized by a cam lock having a projecting finger and provided with a cam lock aperture; a release cam having a cam slot for engagement with said projecting finger of said cam lock and a cam lock release pin in registration with said cam lock aperture; a release shaft having one end fixably carried by said release cam and extending through said housing and into said hollow interior; a release arm fixedly attached to the end of said release shaft opposite said one end and positioned in said hollow interior of said housing for supporting a cementing plug; and manipulating means cooperating with said cam lock whereby said cam lock is selectively moved outwardly against said lock release pin to first disengage said projecting finger from said cam slot and then displace said lock release pin and rotate said release cam, said release shaft and said release arm to allow a cementing plug to drop from a first position to a second position in said hollow interior; and

(c) plug pass indicator means carried by said housing and positioned beneath said plug release means, said plug pass indicator means extending through said housing for contact with a cementing plug when the cementing plug is released by said plug release means, and indicating when the cementing plug has moved from the second position to a position below said plug pass indicator means.

15. A method for cementing casing in a well using at least one cementing plug and a cementing plug container having a removable dome and attached to the casing, comprising the steps of:

(a) providing the cementing plug container with a plug release means characterized by an air cylinder and a release arm means cooperating with the air cylinder and extending inside the cementing plug container to support the cementing plug in a first position in the cementing plug container, and a plug pass indicator means in cooperation with the cementing plug container, the plug pass indicator means having a rotatable star wheel means positioned inside the cementing plug container and located beneath the cementing plug and partially in the path of the cementing plug, to register the passage of the cementing plug from the first position to a second position in the cementing plug container;

(b) removing the dome, placing the cementing plug on the release arm means in the first position in the cementing plug container, and replacing the dome;

(c) introducing cement into the cementing plug container at a point beneath the cementing plug and forcing the cement through the casing to cement the casing in the well;

(d) introducing compressed air into the air cylinder to cause the release arm means to rotate downwardly and allow the cementing plug to drop from the first position to the second position in the cementing plug container to a point above the casing; and

(e) introducing a fluid under pressure into the cementing plug container and forcing the cementing plug from the second position in the cementing plug container through the casing.

4,427,066

OIL RECOVERY METHOD

Evin L. Cook, Dallas, Tex., assignor to Mobil Oil Corporation, New York, N.Y.

Continuation of Ser. No. 261,824, May 8, 1981, abandoned. This application Apr. 21, 1983, Ser. No. 487,345
Int. Cl.³ E21B *43/243*
U.S. Cl. 166—261 **13 Claims**

1. In a method for recovering viscous oil from an oil-bearing subterranean reservoir penetrated by an injection well and a production well, the method comprising:

(a) injecting an oxygen-containing gas comprising at least 75% by volume pure oxygen through said injection well into said reservoir;

(b) igniting oil in said reservoir adjacent said injection well to form a combustion front and to generate hot combustion gases containing a large concentration of carbon dioxide;

(c) continuing to inject said oxygen-containing gas through said injection well to advance said combustion front and oil displacing gases through the reservoir toward said production well;

(d) recovering oil from said reservoir through said production well;

(e) throttling fluid flow from said production well and continuing injection of said oxygen-containing gas without interrupting the injection rate until the bottom-hole pressure of said production well has increased to a desired pressure level; and

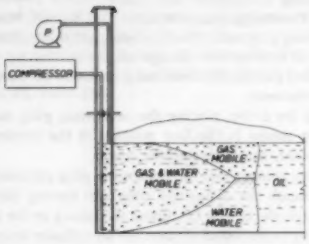
(f) opening said production well and recovering oil therefrom as the bottom-hole pressure of said well declines without interrupting the injection rate of the oxygen-containing gas.

4,427,067

WATER AND MISCIBLE FLUID FLOODING METHOD HAVING GOOD VERTICAL CONFORMANCE FOR RECOVERING OIL

Herbert L. Stone, Houston, Tex., assignor to Exxon Production Research Co., Houston, Tex.

Filed Aug. 6, 1982, Ser. No. 405,833
Int. Cl.[3] E21B *43/16, 43/30*
U.S. Cl. 166—274 10 Claims



1. A method of recovering oil from a subterranean oil reservoir by injection of water and fluid miscible with said oil comprising:

(a) drilling a plurality of wells in communication for injection and production, defining a recovery zone within the reservoir, while spacing said wells sufficiently close and then injecting said water with said miscible fluid in said wells for injection at sufficient rate such that a value between 0.3 and 1.5 is obtained over said recovery zone for the following dimensionless parameter:

$$\frac{I_t}{(\Delta\rho)(k_v)(a)\left(\frac{k_{rw}}{\mu_w}+\frac{k_{rs}}{\mu_s}\right)},$$

where,

I_t is the total injection rate of both the water and the miscible fluid injected into an injection well,

$\Delta\rho$ is the difference in density between the water and the miscible fluid,

k_v is the average vertical permeability of the reservoir,

a is the horizontal area of the reservoir to be flooded by the injection well, and

$$\left(\frac{k_{rw}}{\mu_w}+\frac{k_{rs}}{\mu_s}\right)$$

is the sum of the mobilities of the water and the miscible fluid at steady state around the injection well;

(b) producing said oil from said reservoir from said production wells.

4,427,068

SINTERED SPHERICAL PELLETS CONTAINING CLAY AS A MAJOR COMPONENT USEFUL FOR GAS AND OIL WELL PROPPANTS

Jeremiah J. Fitzgibbon, Lafayette, La., assignor to Kennecott Corporation, Cleveland, Ohio

Continuation-in-part of Ser. No. 347,210, Feb. 9, 1982. This application Aug. 4, 1982, Ser. No. 405,055
Int. Cl.[3] E21B *43/267*
U.S. Cl. 166—280 6 Claims

3. A method for increasing permeability in a subterranean formation penetrated by a well wherein a fluid is pumped into the well to create a fracture in said subterranean formation, the improvement which comprises introducing into a fluid composite, spherical, sintered pellets comprised of clay and a member of the group of bauxite, alumina, or mixtures thereof, said pellets containing on a dry weight basis a major portion of clay, said pellets having an apparent specific gravity of less than 3.40; introducing said pellet-containing fluid into a fracture, the compaction pressure of which is between about 280 and about 700 Kg/cm^2 (4,000 and about 10,000 psi), to deposit a propping distribution of said pellets, said pellets having an average particle size between 0.1 and 2.5 millimeters.

4,427,069

SAND CONSOLIDATION METHODS

Robert H. Friedman, Houston, Tex., assignor to Getty Oil Company, Houston, Tex.

Filed Jun. 8, 1981, Ser. No. 271,426
Int. Cl.[3] E21B *33/138*
U.S. Cl. 166—295 15 Claims

1. A method for selectively consolidating sand grains surround a borehole in a relatively high-temperature subterranean formation, comprising:

providing an aqueous fluid composition of an acidic salt catalyst selected from the group consisting of $ZnCl_2$, $AlCl_3$, $CrCl_3$ and $ZrCl_4$, the catalyst effective to cure a polymerizable furfuryl alcohol oligomer resin and effective to adsorb to the surface of sand grains;

passing the catalyst composition through said borehole and into the formation surrounding the borehole;

allowing the acidic salt catalyst to be adsorbed onto the surface of the sand grains, said acidic salt catalyst forming a dispersed acid salt catalyst layer on the surface of the sand grains;

providing a resin composition comprising polymerizable furfuryl alcohol oligomer resin;

following the passage of the catalyst composition into the formation, passing the resin composition through said borehole and into the formation surrounding the borehole; and

polymerizing the resin at the site of the adsorbed acidic salt catalyst to form as a reaction product a polymer effective to consolidate the sand grains without substantially reducing the permeability through the consolidated formation.

2. A method for selectively consolidating sand grains surrounding a borehole in a relatively high-temperature subterranean formation, comprising:

providing a fluid composition of an acidic salt catalyst, the catalyst effective to cure a selected polymerizable resin and effective to adsorb to the surface of the sand grains;

passing the catalyst composition through said borehole and into the formation surrounding the borehole;

allowing the acidic salt catalyst to be adsorbed onto the surface of the sand grains, said acidic salt catalyst forming a dispersed acid salt catalyst layer on the surface of the sand grains;

providing a mixture comprising the selected polymerizable resin and an ester of weak organic acid, the organic acid being insufficiently strong to catalyze polymerization of the polymerizable resin;

passing the resin composition through said borehole and into the formation surrounding the borehole;

polymerizing the resin at the site of the adsorbed acid salt catalyst to form as a reaction product a polymer effective to consolidate the sand grains without substantially reducing the permeability therethrough; and

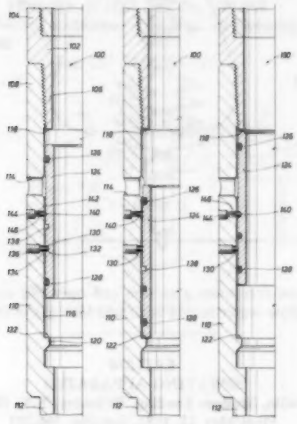
hydrolyzing the ester with the water produced as a by-product of the polymerization reaction, the hydrolysis reaction serving to control the extent of resin polymerization reaction by limiting the amount of water available for the back depolymerization reaction.

4,427,070

CIRCULATING AND PRESSURE EQUALIZING SUB

Thomas B. O'Brien, Midland, Tex., assignor to O'Brien-Goins Engineering, Inc., Midland, Tex.

Filed Mar. 29, 1982, Ser. No. 363,002
Int. Cl.³ E21B 34/10
U.S. Cl. 166—317 13 Claims



1. A circulating sub for installation as a part of the tubing string above the packer sealing the tubing string with respect to the well casing, said circulating sub comprising:

(a) body means adapted for threaded connection to joints of tubing, said body means defining a circulating passage in communication with the tubing and an equalizing port capable of communicating said circulating passage with the annulus between the tubing and casing;

(b) equalizing valve means movably positioned within said circulating passage and normally closing said equalizing port;

(c) fluid pressure differential responsive valve actuator means being passed through said tubing and moving into passage closing engagement with said equalizing valve means to permit opening of said equalizing valve means responsive to predetermined fluid pressure applied from said tubing to thus permit equalization of tubing and casing pressure and permit pumping of kill fluid through said tubing and through said equalizing port into the annulus between the tubing and casing to kill the well; and

(d) yieldable lock means restraining said equalizing valve against movement relative to said body means below a predetermined pressure differential and yielding at said predetermined pressure differential to permit pressure energized movement of said equalizing valve to said open position, said yieldable lock means comprising:

(1) a first lock element yielding at said preselected pressure differential to permit opening of said equalizing valve, and

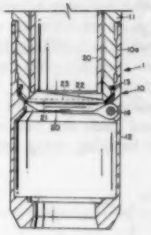
(2) a second lock element being movable into locking engagement with said equalizing valve upon movement of said equalizing valve to a preselected closed position, said second lock element also being yieldable at said preselected pressure differential to permit subsequent opening of said equalizing valve element.

4,427,071

FLAPPER TYPE SAFETY VALVE FOR SUBTERRANEAN WELLS

Michael A. Carmody, Broken Arrow, Okla., assignor to Baker Oil Tools, Inc., Orange, Calif.

Filed Feb. 18, 1982, Ser. No. 349,785
Int. Cl.³ E21B 34/10, 34/12
U.S. Cl. 166—332 1 Claim



1. A flapper type valve for a subterranean well comprising, in combination: a tubular conduit, means on said tubular conduit defining a downwardly facing, annular conical valve seat; a flapper valve having an annular conical surface cooperable with said valve seat in sealing relation; pivot means on one side of said tubular conduit for mounting said flapper valve to said conduit to permit downward pivotal movement of said flapper valve away from said valve seat to a vertical open position; resilient means urging said flapper valve upwardly to its closed sealing position; a valve actuating sleeve disposed in said tubular conduit, means for moving said actuating sleeve downwardly to engage and open said flapper valve; an elevated top surface on said flapper valve said elevated surface on said flapper valve comprising a planar surface inclined relative to a radial plane of said actuating sleeve, said planar surface being sloped upwardly away from said pivotal means; said annular conical surface cooperable with said valve seat extending upwardly beyond said valve seat to receive the initial contact of said actuating sleeve remote from said pivot means; and an arcuate cylindrical recess of the same diameter as the exterior of said actuating sleeve, extending through said elevated surface and said annular conical surface, and being positioned to receive the exterior of said actuating sleeve when said flapper valve is shifted downwardly by said sleeve to its vertical open position.

4,427,072

METHOD AND APPARATUS FOR DEEP UNDERWATER WELL DRILLING AND COMPLETION

John E. Lawson, London, England, assignor to Armco Inc., Middletown, Ohio

Filed May 21, 1982, Ser. No. 380,910
Int. Cl.³ E21B 7/12, 43/01
U.S. Cl. 166—345 12 Claims

1. A method for remotely establishing an underwater well under conditions of great water depth, comprising the steps of

installing at the floor of the body of water a generally upright support rigidly secured in the floor and projecting upwardly therefrom,

lowering a drilling guide structure onto the upright support with a single handling string,

vertically orienting the drilling guide structure relative to the water surface,

locking the drilling guide structure to the upright support in the vertical position,

lowering a drilling guide arm unit, carrying a drilling string and bit, along the single handling string onto the drilling guide structure,

orienting the drilling bit to a desired well position by coact-

ing the drilling guide arm unit with the drilling guide structure,

drilling a well in the desired position with the drilling bit and installing well casing into the well,

retrieving the drilling string, drilling bit and drilling guide arm unit to the surface,

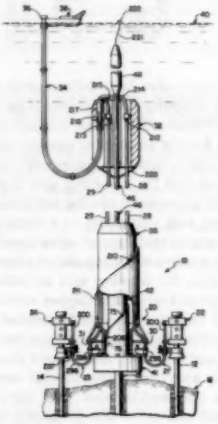
lowering a flowline guide arm unit, carrying a cross-over flowline assembly, along the single handling string onto the drilling guide structure,

orienting the flowline assembly relative to the well casing and the drilling guide structure, by coacting the flowline guide arm unit with the drilling guide structure,

landing the flowline assembly onto the well casing and the drilling guide structure,

retrieving the flowline guide arm unit to the surface,

lowering a wellhead guide arm unit, carrying a wellhead, along the single handling string onto the drilling guide structure,



orienting the wellhead with the well casing and the flowline assembly by coacting the wellhead guide arm unit with the drilling guide structure,

coupling the wellhead to the well casing and the flowline assembly,

retrieving the wellhead guide arm unit to the surface,

lowering a production gathering assembly, including a flowline riser extending upwardly therefrom with a connector extending downwardly therefrom, along the single handling string onto the drilling guide structure,

orienting the production gathering assembly connector with the flowline assembly by coacting the gathering assembly with the drilling guide structure, and

coupling the connector to the flowline assembly to provide a fluid-flow communication between the well casing and the flowline riser via the wellhead, flowline assembly, and connector.

4,427,073

DEEP WATER HYDROSTATIC HEAD CONTROL

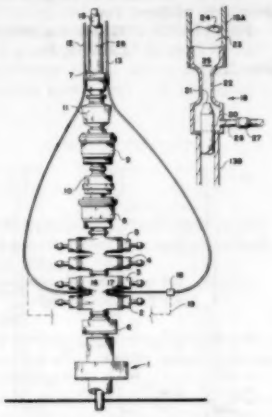
James H. Sykora, P.O. Box 64677, Baton Rouge, La. 70896

Filed May 10, 1982, Ser. No. 376,409

Int. Cl.[3] E21B *43/01*

U.S. Cl. 166—364 **2 Claims**

1. In a marine riser and BOP stack assembly positioned near the bottom of a water body and having multiple rams, a kill line and a choke line, the improvement to which comprises connecting an eductor to said choke line to receive any kick gas from said assembly through an eductor intake opening wherein



said eductor comprises a suction end openable to said water body to allow water to mix with said kick gas in said eductor.

4,427,074

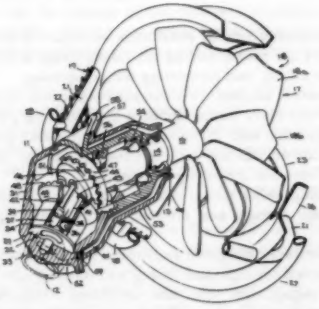
SPRAYING APPARATUS

Goesta Wollin, Snedens Landing, Palisades, N.Y. 10964

Filed May 22, 1981, Ser. No. 266,281

Int. Cl.[3] A62C *1/00*

U.S. Cl. 169—46 **29 Claims**



1. Spraying apparatus comprising:

a liquid-powered, positive displacement reciprocating motor for producing rotary motion, said motor having power transfer means for converting a potential energy of the pressurized liquid to a mechanical energy;

impeller means connected to said motor to be rotated thereby for generating a stream of moving air;

intake port means for receiving pressurized liquid having energy to power said motor and supplying said pressurized liquid to said power transfer means;

low-pressure liquid exit means connected to said power transfer means for receiving at least a portion of a low-pressure liquid which is expelled from said power transfer means after said energy conversion; and

conduit means having

an inlet means connected to receive at least a portion of the liquid received to power said motor, and

a shell surrounding said power transfer means and spaced therefrom to define a generally annular channel intermedi-

ate of said power transfer means and said shell for delivering to the stream of air at least a portion of the liquid entering said intake port means, the portion of the liquid delivered to the stream of air being entrained in the stream and moved by the stream.

4,427,075

ELECTROHYDRAULIC CONTROL DEVICE FOR USE IN AGRICULTURAL MACHINES

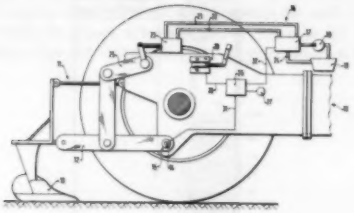
Roman Romes, Friolzheim, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

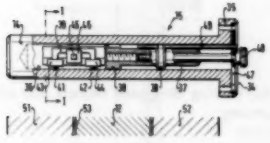
Filed Feb. 2, 1981, Ser. No. 230,583

Claims priority, application Fed. Rep. of Germany, Feb. 8, 1980, 3004592

Int. Cl.³ A01B *63/112*

U.S. Cl. 172—7 **16 Claims**





1. An electrohydraulic control device for use in connection with a lifting unit of an agricultural mobile machine, particularly a tractor having a frame, a control rod coupled to said lifting unit, a pivot pin mounted on said frame for pivotally supporting said control rod, said control device comprising at least one source of pressure medium, a hydraulic motor; a solenoid-controlled directional control valve for controlling the hydraulic motor; a pick-up means cooperating with said pivot pin to generate electrical signals in response to mechanical forces acting on said pin, said pick-up means controlling via the solenoid of said directional control valve said lifting unit to lift or lower said control rod in response to the increase or decrease of the mechanical forces acting on the pin; said pick-up means including a magnetic core, said core supporting at least one induction coil, said pivot pin being formed with an axial well having a wall of a soft magnetic material, and said core being arranged in said well to detect magnetic changes in said wall material resulting from the applied mechanical forces.

4,427,076

TUBULAR SPIKE CARRYING SHAFT

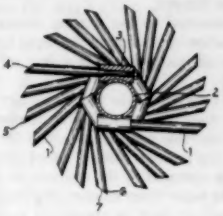
Doroteo J. De Aberasturi, Vitoria, Spain, assignor to Agrator, S.A., Vitoria, Spain

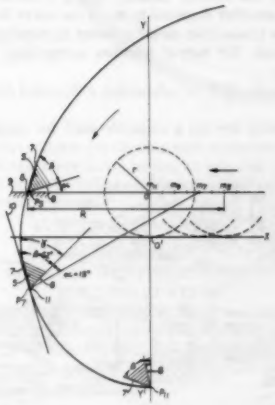
Filed Aug. 21, 1981, Ser. No. 294,921

Int. Cl.³ A01B *33/02, 33/12, 33/14*

U.S. Cl. 172—548 **7 Claims**

1. A tubular spike carrying shaft for rotary cultivators comprising a tubular shaft, a plurality of spiked tools attached at joints on the periphery of said shaft, said joints being angularly offset from one another so as to describe helical lines along the length of the shaft, the longitudinal spacing between consecutive tool tips on the shaft being between zero and three times as large as the greatest width of one of said tools, a tip of each spiked tool comprising a working face and an approach face which intersect at a cutting edge, and wherein for each tool a line joining the shaft axis to the cutting edge of the tool forms





a positive angle α with a tangent to the working face of the tool at the cutting edge, where $\alpha \geq 15°$, and an angle β is formed between the working face and the approach face wherein β is in the range between approximately 35° and 75° and the sum of α and β is less than or equal to 90° and wherein the tools are attached perpendicularly to the axis of the shaft.

4,427,077

PORTABLE FASTENING TOOL WITH MANUAL TURN ON AND AUTOMATIC SHUT OFF

George D. Hall, Oakmont, Pa., assignor to Rockwell International Corporation, Pittsburgh, Pa.

Filed Oct. 25, 1979, Ser. No. 88,327

Int. Cl.³ B25B *23/145*

U.S. Cl. 173—12 **8 Claims**

1. A fastening tool for advancing a threaded fastener, comprising:

a fluid motor driving a rotatable shaft for rotating the fastener;

a power fluid conduit for connection to a source of high pressure fluid and including a valve seat therein separating the conduit into a first section extending toward the source and a second section extending toward the fluid motor;

a valve movable between a closed position engaging the seat toward an open position in the first conduit section for opening and closing the conduit for respectively starting and stopping the motor, the valve being biased in the

closed position toward the closed position by high pressure fluid from the fluid source;

means biasing the valve from the open position toward the closed position;

means for sensing input tightening characteristics applied to the fastener by the tool and for generating a signal in response thereto;

means connected to the sensing means for conducting a computation operation on the input tightening characteristic signals and generating a shut off signal in response thereto;

means for connecting the tool to battery means; and

means for manipulating the valve comprising

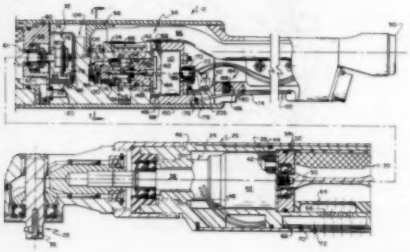
a hand movable member mounted for movement from a tool stop position toward a tool running position;

a linkage operated by the member for mechanically moving the valve from its normally closed position toward an open position in opposition to high pressure fluid from the fluid source; and

a solenoid, connected to the connecting means and energizable by the battery means, having a linearly movable output member disposed to move the valve from the open position toward the closed position in response to the shut off signal, the output member comprising part of the linkage.

8. A fastening tool for advancing a threaded fastener, comprising

a fluid motor driving a rotatable shaft for rotating the fastener;



a power fluid conduit for connection to a source of high pressure fluid and including a valve seat therein separating the conduit into a first section extending toward the source and a second section extending toward the fluid motor;

a valve movable between a closed position engaging the seat toward an open position for opening and closing the conduit for respectively starting and stopping the motor;

means biasing the valve from the open position toward the closed position;

means for sensing input tightening characteristics applied to the fastener by the tool and for generating a signal in response thereto;

means connected to the sensing means for conducting a computation operation on the input tightening characteristic signals and generating a shut off signal in response thereto;

means for connecting the tool to a source of electric power; and

means for manipulating the valve comprising

a hand movable member mounted for movement from a tool stop position toward a tool running position;

a linkage operated by the member for mechanically moving the valve from its normally closed position toward an open position; and

a solenoid, connected to the connecting means and energizable by the power source, having a linearly movable output member disposed to move the valve from the open position toward the closed position in response to the shut off signal, the output member comprising part of the linkage.

4,427,078

PILE-DRIVING RAM

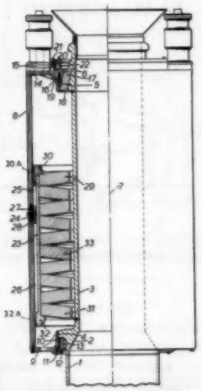
Henk R. Wolters, Delft, and Paul Sillem, Rotterdam, both of Netherlands, assignors to De Rotterdamsche Droogdok MIJ B.V., Rotterdam, Netherlands

Filed Apr. 8, 1981, Ser. No. 252,209

Claims priority, application Netherlands, Apr. 8, 1980, 8002035

Int. Cl.³ B25D *9/04*

U.S. Cl. 173—126 **8 Claims**



1. A ram for driving elongated objects into and out of the ground comprising:

a piston jacket;

a cylinder jacket co-axially arranged with respect to said piston jacket and forming a space therebetween;

an anvil disposed near one end of said ram;

means guided by said piston jacket for directly impacting with said anvil and for reciprocating at least substantially in a direction of driving displacement of the elongated object during driving operation wherein said means for impacting further comprises a plurality of cup springs arranged in series in the direction of driving said object and which are in contact with one another wherein an outermost cup spring of said plurality of cup springs directly impacts said anvil during driving operation;

first and second sealing members located at opposite end portions of said piston jacket for cooperative engagement with a facing wall portion of the cylinder jacket;

a ring positioned between said first and second sealing members, fastened to the cylinder jacket slidably contacting the piston jacket and dividing said space between the piston jacket and the cylinder jackets in two parts;

means for introducing pressurized fluid beneath and above the ring into said space formed between the cylinder jacket and the piston jacket.

4,427,079

INTERMITTENTLY ROTATABLE DOWN HOLE DRILLING TOOL

Bruno H. Walter, 45 College St., Kingston, Ontario, Canada K7L 4L5

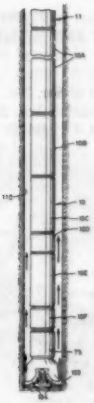
Filed Nov. 18, 1981, Ser. No. 322,402

Int. Cl.³ E21B *4/02*

U.S. Cl. 175—106 **25 Claims**

1. A down hole drilling tool comprising an elongated hollow housing having a longitudinal axis and having an upper end

and a lower end, a fluid control valve which is mounted within the housing for axial movement between an upper position and a lower position and which comprises a first valve member and a second valve member movable relative to the first valve member between a closed condition of the valve in which the valve substantially prevents downward flow of pressurized fluid through the housing past the valve and an open condition of the valve in which downward flow of pressurized fluid is permitted through the valve, the valve being upwardly urged and having valve actuation means which on operative downward movement of the valve under the influence of pressurised fluid thereabove and against the influence of the upward urging of the valve and during which the valve is in its closed condition causes actuation of the valve to its open condition when the valve attains its lower position, and which on operative upward movement of the valve under the influence of the upward urging of the valve and during which the valve is in its open condition causes actuation of the valve to its closed condition when the valve attains its upper position, a torque



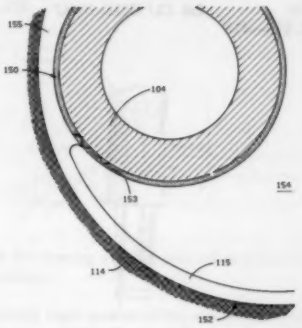
member rotatably mounted within the housing and continuously coupled to the first valve member, helically disposed first coupling means, second coupling means engaged with the first coupling means for operative rotation of the torque member in one direction during downward movement of the first valve member and operative rotation of the torque member in the opposite direction during upward movement of the first valve member, a drill bit rotatably mounted on and projecting downwardly from the lower end of the housing, a one-way clutch interconnecting the torque member and the drill bit for drivingly coupling the torque member to the drill bit only during operative rotation of the torque member in said one direction whereby the drill bit is operatively intermittently rotated, fluid flushing ducting provided in the drill bit, and fluid flow passage means interconnecting the valve with the fluid flushing ducting for operative flow of pressurized fluid through the valve, the fluid flow passage means and the fluid flushing ducting in the drill bit only while the torque member is operatively rotating in said opposite direction during which the valve is in its open condition and the drill bit is non-rotating.

4,427,080

APPARATUS FOR PREVENTING DIFFERENTIAL STICKING IN WELLS

Ronald P. Steiger, Houston, Tex., assignor to Exxon Production Research Co., Houston, Tex.

Filed Dec. 11, 1980, Ser. No. 215,209
Int. Cl.³ E21B *17/16, 47/00*
U.S. Cl. 175—325 **33 Claims**



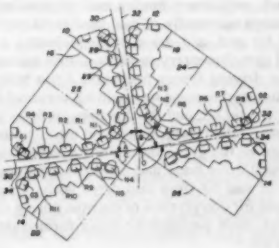
1. Apparatus suitable for use in a well comprising a substantially imperforate inner sector having an adherent outer porous coating with porosity sufficient to substantially prevent downhole differential sticking.

4,427,081

ROTARY ROCK BIT WITH INDEPENDENTLY TRUE ROLLING CUTTERS

Micheal B. Crawford, Duncanville, Tex., assignor to Dresser Industries, Inc., Dallas, Tex.

Filed Jan. 19, 1982, Ser. No. 340,615
Int. Cl.³ E21B *10/08*
U.S. Cl. 175—376 **3 Claims**



1. A rock bit for drilling a borehole having a plurality of rotary conical cutters supported on bearing pins defining the rotary axis of each cutter at a common angle with respect to the axis of rotation of said bit and each of said cutters having a plurality of intermediate annular rows of cutting structure projecting therefrom with the outermost extent of each projection, when rotated to a common plane, interconnectable by a generally straight line which intersects the axis of rotation of the bit and the rotary axis of the cutter, whereby said intermediate cutting structure has true rolling contact with the borehole bottom and wherein diametrically opposed interconnecting straight lines of each cutter converge to intersect at an angle, with said last mentioned angle of each cutter being distinctly different from the like defined angle of any other cutter on said bit whereby each cutter cuts a bottom formation on true-rolling engagement and further contacts the borehole

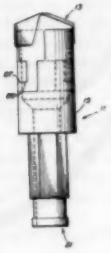
bottom at distinctly different angle than the remaining cutters thereby resulting in a wavy bottom configuration.

4,427,082

MINING DRILL

Vinod K. Sarin, Lexington, and Peter Oberhauser, Sudbury, both of Mass., assignors to GTE Laboratories, Inc., Waltham, Mass.

Filed Feb. 8, 1982, Ser. No. 346,970
Int. Cl.³ E21B *10/62*
U.S. Cl. 175—413 **2 Claims**



1. A mine drill for aiding collection of detritus during drilling comprising a drive body being cylindrically shaped about an axis of rotation and having an axial passage for the flow of detritus, a bit mounted at the forward end of said drive body and adapted for being forwardly driven and rotated about said axis of rotation in a given direction during drilling, said bit comprising a body portion having a pair of support lands projecting therefrom in the axial direction and an elongated insert, said insert having forwardly projecting cutting edges, a base surface and side surfaces normal to said base surface extending toward said cutting edges, said base surface lying in a plane substantially normal to the axis of rotation and secured to respective opposite sides of said insert whereby during rotation of said bit leading side surfaces are substantially unobstructed and trailing insert surfaces are mounted to respective support lands, said insert having end portions extending in a radial direction outwardly of said base portion and said drive body, said bit and said drive body including a plurality of mating and complimentary surfaces, a first mating surface for transmitting driving forces from said drive body to said bit, second mating surfaces for transmitting torsional forces of said drive body to said bit, and third mating surfaces adapted to be in overlapping relationship when said bit is twisted in a direction opposite to the given direction for detachably mounting said bit to said drive body and preventing forward separating movement of said bit from said drive body, a pair of air passages adapted for conveyance of detritus during drilling to said axial passage, each passageway being formed on an opposite side of said bit.

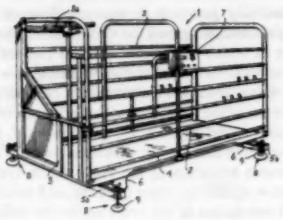
4,427,083

LIVESTOCK WEIGHING APPARATUS

John R. Muddle, Lewis, England, assignor to Poldenvale Ltd., Taunton, England

PCT No. PCT/GB80/00177, § 371 Date Jun. 15, 1981, § 102(e) Date Jun. 15, 1981, PCT Pub. No. WO81/01196, PCT Pub. Date Apr. 30, 1981
PCT Filed Oct. 22, 1980, Ser. No. 276,376
Claims priority, application United Kingdom, Oct. 23, 1979, 7936800
Int. Cl.³ G01G *17/08*
U.S. Cl. 177—132 **6 Claims**

1. Livestock weighing apparatus comprising an animal supporting platform supported from below by means including a plurality of electrical load-sensing means, the electrical outputs from the load-sensing means being summed in an electronic circuit the output of which is fed to a read-out device, characterised in that the platform defines the base of an animal crush or crate, the load-sensing means being located in groups in a load beam (**5***a*, **5***b*) of rigid construction, two such load beams



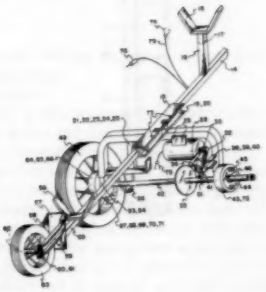
being secured to the underside of the platform (**4**), one adjacent to each of two opposite ends thereof, and each load beam being provided with an adjustable foot (**8**) adjacent each end thereof for rigidly supporting each load beam and thus the crush or crate on a supporting surface for the apparatus.

4,427,084

GOLF CART AND SIMILAR VEHICLES

Hassel J. Savard, Jr., Neshanic, N.J., assignor to Golf-Eze, Linden, N.J.

Continuation-in-part of Ser. No. 233,042, Feb. 10, 1981, abandoned. This application Jun. 26, 1981, Ser. No. 277,620
Int. Cl.³ B62D *51/04*
U.S. Cl. 180—19 H **9 Claims**



1. A motor driven vehicle for loads such as golf bags and the like, which comprises in combination a frame including an upper stem and a lower stem; a guiding wheel connected to the end of the lower stem; an inverted U-shaped member connected to at least one of said upper and lower stems; an axle connected to said U-shaped member; two side wheels dismountably connected to said axle; a control handle grasped by the operator of the vehicle while walking along with the vehicle and controlling the movement thereof, said handle including a first portion fixedly connected to the vehicle and a free end portion connected to said first portion for limited movement relative thereto over a given travel path, said free end portion being disposed to be grasped by the operator; resilient means biasing said free end portion of the handle toward a predetermined reference position along said travel path; motor speed control means coupled to said handle and connected to the drive motor of the vehicle to regulate the speed of the drive motor in accordance with the positioning of said first portion of the handle and the free end of the handle in relation to said reference position, said speed control means including a rheostat connected to said drive motor to regulate the speed

thereof, and a gear mechanism connected to and regulating said rheostate, said gear mechanism interconnecting said first portion of said handle and said free end portion to follow the relative movement therebetween and impart a corresponding adjustment movement to the rheostat, means for connecting said drive motor to said axle, each of said side wheels including a one-way clutch driven by said axle.

4,427,085

WHEEL SUPPORT ASSEMBLY FOR A MOTOR VEHICLE

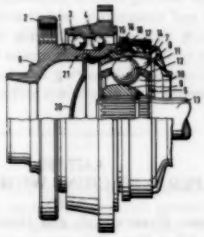
Erich Aucktor, Offenbach am Main, Fed. Rep. of Germany, assignor to Löhr & Bromkamp GmbH, Offenbach am Main, Fed. Rep. of Germany

Filed Feb. 26, 1981, Ser. No. 238,625

Claims priority, application Fed. Rep. of Germany, Mar. 11, 1980, 3009199

Int. Cl.³ B60K *17/30*

U.S. Cl. 180—70 R **4 Claims**



1. A wheel hub assembly for a motor vehicle wheel comprising: bearing means including an outer bearing ring adapted to be affixed with a vehicle chassis and an inner bearing ring having said wheel mounted thereon; rotary joint means including an inner joint member and an outer joint member rotatively fixed with said inner bearing ring; first surface means including an inner axis-parallel annular face provided in said inner bearing ring opening toward said rotary joint means and receiving said outer joint member therein; second surface means provided on said outer joint member on the side facing said bearing means arranged in cooperative relationship with said first surface means to mount said outer joint member within said inner bearing ring, said second surface means including a centering surface engaging within said inner axis-parallel annular face to provide a centering effect between said outer joint member and said inner bearing ring, said centering surface simultaneously serving as a welding face for a welded joint formed by a low-heat welding process between said inner bearing ring and said outer joint member; a first oblique annular surface forming part of said first surface means extending contiguously with said inner axis-parallel annular face; and a second oblique annular surface forming part of said second surface means extending contiguously with said centering surface; said first and said second oblique annular surfaces being arranged in facing juxtaposed relationship and spaced apart from each other a distance to inhibit heat transfer between said inner bearing ring and said outer joint member.

4,427,086

VEHICLE FITTED WITH AN AUXILIARY WHEEL FOR PROPELLING, GUIDING AND OR BRAKING THE VEHICLE

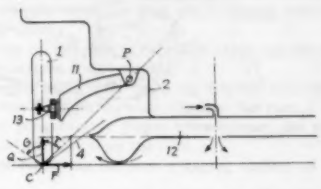
Claude de Coiselet (de F.), 50 Chemin de la Foret, 78860 Saint Nom la Breteche, France

Filed Dec. 24, 1980, Ser. No. 219,570

Claims priority, application France, Dec. 27, 1979, 79 31836

Int. Cl.³ B60V *1/00, 3/02*

U.S. Cl. 180—119 **9 Claims**



9. A vehicle for moving along a path relative to a support surface, comprising:

a frame;

highly resiliently rigid ground effect means for supporting said frame at an essentially fixed distance from said support surface;

at least one rotatable wheel contacting said support surface at a point of contact, said wheel being subject to external forces acting parallel or transverse to said path, or both, through said point of contact in the plane of said support surface, said support surface and said wheel having a known cone of friction with a half angle;

means for supporting said at least one rotatable wheel for rotating movement along said support surface and about a spindle extending substantially in parallel with said support surface, for transmitting torque applied by said external forces and for enabling said at least one wheel to pivot about an axis substantially perpendicular to said support surface;

hinged connection means, including a pair of convergent arms hinged to said means for supporting said wheel and to said frame, for allowing said at least one wheel to swing in a plane substantially perpendicular to said support surface, the intersection of the axes of said arms defining a virtual axis of rotation which intersects planes, which are perpendicular to said support surface and contain the vectors of said external forces, at points of intersection above said support surface and beyond said point of contact in the direction of said external forces, and for causing the vectors of the resultant forces transmitted to said frame under the influence of said external forces to extend at resultant angles to a perpendicular from said support surface, said resultant angles being less than said half angle,

wherein in response to said external forces acting at said point of contact, said at least one rotatable wheel is held constantly in contact with said support surface.

4,427,087

MOTORCYCLE PROVIDED WITH AN ENGINE HAVING A SUPERCHARGER

Kazuo Inoue, Tokyo, and Tsuneo Otsuka, Wako, both of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 15, 1982, Ser. No. 339,471

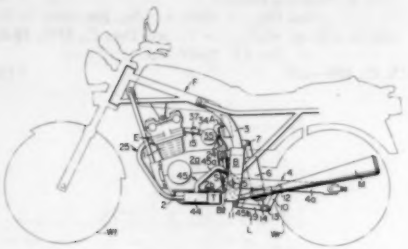
Claims priority, application Japan, Jan. 14, 1981, 56-4369; Jan. 14, 1981, 56-4370; Jan. 21, 1981, 56-7357; Jan. 27, 1981, 56-10354

Int. Cl.³ B62D *61/02*; F02B *37/00*

U.S. Cl. 180—219 **5 Claims**

1. A motorcycle comprising a body frame; an engine

mounted on said body frame, said engine having an engine body and a transmission case integral with and below said engine body; a rear fork having a pair of fork legs disposed on both left and right sides of a rear wheel and having a forward



end pivotally mounted on said body frame to the rear of said engine body, for upward and downward swinging movement; and a supercharger mounted on the rear surface of said transmission case between said paired fork legs of the rear fork, said supercharger compressing air taken into said engine.

4,427,088

POWER UNIT APPARATUS FOR MOTORCYCLES

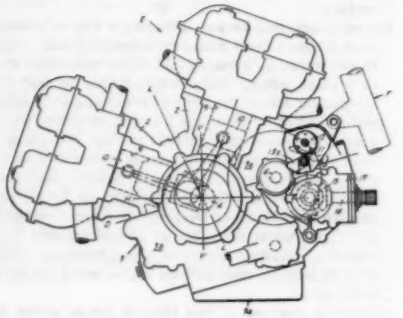
Masaharu Tsuboi, Sayama, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 19, 1982, Ser. No. 369,791

Claims priority, application Japan, Apr. 20, 1981, 56-56800[U]

Int. Cl.³ B62D *61/02*

U.S. Cl. 180—219 **3 Claims**



1. Power unit apparatus for a motorcycle including an internal combustion engine having a crankshaft, and having a power unit case combining a crankcase and a transmission case, comprising, in combination: a main shaft associated with the crankcase, a counter shaft adapted to drive a rear wheel of the motorcycle, a reduction gear mechanism for driving said counter shaft from said main shaft, said mechanism having a guide shaft supporting shift forks for shifting said mechanism, a shift drum for actuating said shift forks, said power unit case being divided into an upper section and a lower section so that said crankshaft and said main shaft are supported on the dividing plane between said sections, said guide shaft and said shift drum being supported on said upper section above said main shaft and said counter shaft, said counter shaft being supported on said lower section.

4,427,089

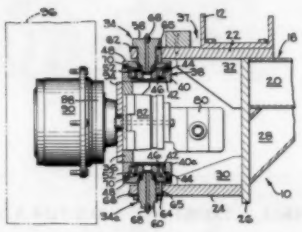
STEERABLE DRIVE AXLE WITH LARGE CRAMP ANGLE

John G. Peterson, San Jose, Calif., assignor to FMC Corporation, Chicago, Ill.

Filed Apr. 12, 1982, Ser. No. 367,330

Int. Cl.³ B60K *17/30*

U.S. Cl. 180—253 **8 Claims**



1. A steerable drive axle for a vehicle for rotating a wheel about a drive axis and for turning the wheel about a steering axis substantially normal to the drive axis; comprising means defining a pair of spaced king pins in substantial axial alignment with said steering axis, means defining a trunnion assembly, wheel drive power means supported by said trunnion assembly and operatively connected to said wheel, means defining spaced pairs of bearing units in substantial alignment with said steering axis and connecting said trunnion assembly to said king pins, each pair of bearing units including a spherical bearing and a roller bearing, and means for turning said trunnion assembly about said steering axis for pivoting said wheel about said steering axis an amount sufficient to provide a 45° cramp angle.

4,427,090

AGRICULTURAL MACHINE WITH DISPLACEABLE CABIN

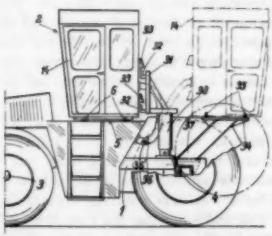
Nils Fredriksen, Harsewinkel, and Heinrich Wecker, Paderborn, both of Fed. Rep. of Germany, assignors to Claas OHG, Harsewinkel, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 279,037, Jun. 30, 1981, abandoned. This application Jul. 15, 1981, Ser. No. 283,664

Claims priority, application Fed. Rep. of Germany, Jun. 30, 1980, 3024664

Int. Cl.³ B62D *33/06*

U.S. Cl. 180—327 **22 Claims**



1. A multiple-purpose agricultural machine with a driver's cabin displaceable between at least two working positions, comprising a chassis; control means extending from the driver's cabin and being permanently connected to said chassis by flexible conduit means; at least two separate supporting means each provided on said chassis at a respective one of said working positions; means for detachably mounting said driver's

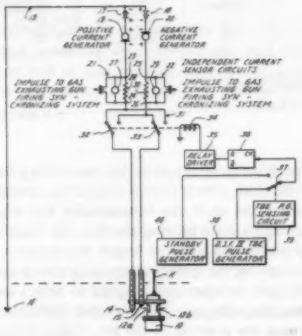
cabin selectively on one of said supporting means; displacing means mounted on said chassis and being engageable with said driver's cabin to lift the same from said one supporting means and displace the cabin to the other supporting means; and means for locking the cabin in position on the selected supporting means.

4,427,091

FAIL-SAFE CIRCUIT MECHANISM FOR GENERATING A PULSE INDICATING THE PRECISE MOMENT OF FIRING OF A GAS EXHAUSTING GUN

Lloyd E. Elliott, Jr., and John L. Hudson, both of Houston, Tex., assignors to Texaco Inc., White Plains, N.Y.

Continuation-in-part of Ser. No. 90,158, Oct. 31, 1979, abandoned, which is a continuation-in-part of Ser. No. 913,764, Jun. 8, 1978, abandoned, and Ser. No. 59,792, Jul. 23, 1979, Pat. No. 4,243,116. This application Jan. 26, 1981, Ser. No. 228,433
The portion of the term of this patent subsequent to Jan. 6, 1998, has been disclaimed.
Int. Cl.³ G01V *1/38, 1/14*
U.S. Cl. 181—120 **8 Claims**


POSITIVE CURRENT GENERATOR
NEGATIVE CURRENT GENERATOR
INDEPENDENT CURRENT SENSOR CIRCUITS
IMPULSE TO GAS EXHAUSTING GUN FIRING SYN - CHRONIZING SYSTEM
IMPULSE TO GAS EXHAUSTING GUN FIRING SYN - CHRONIZING SYSTEM
RELAY DRIVERS
TDC P.E. SENSING CIRCUIT
STANDBY PULSE GENERATOR
D.I.F.M. TDC PULSE GENERATOR

1. An indicator for detecting the precise moment of firing of a gas exhausting gun means for a seismic record comprising,

(a) circuit means for generating a current to two closely spaced apart electrodes submerged underwater very close to gas exhausting gun means exhaust port, and

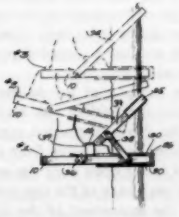
(b) said circuit means including a sea ground as a backup electrode when any one of the two electrodes becomes defective for providing a fail-safe indicator.

4,427,092

TREE STAND

Lynn A. Tentler, Fonddulac, Wis.

Filed Jan. 21, 1981, Ser. No. 226,629
Int. Cl.³ A63B *27/00*
U.S. Cl. 182—134 **2 Claims**



1. A tree stand comprising,

a platform having a notch therein adapted to bear against a tree trunk of 6" diameter or more at points well spaced from an extension of the centerline of the platform and notch,

a metal support strap which is flexible along its length to enable it to embrace the tree trunk and which is adjustably connected to the platform so the platform is generally horizontal in use,

said notch engaging one side of a tree and the strap engaging the other side of the tree at a vertically elevated location so weight on the platform tends to drive the platform against the tree trunk and tilting the outer or front portion of the platform upwardly acts to disengage the tree stand from the tree the notch has sides which diverge from the root of the notch,

the sides of the root portion of the notch being concave and leading to outer convex portions,

the concave and convex curves being selected so a small diameter tree engages the sides close to the root of the notch and progressively larger trees contact the sides progressively further from the root,

an elastomer facing on the tree engaging surface of the notch,

an elastomer facing on the tree engaging surface of the strap,

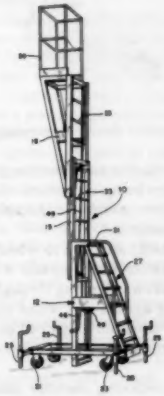
said elastomer facings acting to grip the tree to mount the platform on the tree without sliding and without damage to the tree.

4,427,093

LOCKING DEVICE

Donald T. Wehmeyer, Roselle, and Ronald W. Barnhart, Elmhurst, both of Ill., assignors to Economy Engineering Company, Bensenville, Ill.

Filed Dec. 29, 1980, Ser. No. 220,821
Int. Cl.³ B66B *9/20*; E04G *1/22*
U.S. Cl. 182—141 **21 Claims**



1. An automatic locking device for a telescoping work platform comprising: a base frame, a middle frame and a platform frame, said device comprising:

base-locking means for automatically locking the base frame to the middle frame when said middle frame is in a fully retracted position;

base-unlocking means mounted on said platform frame for automatically unlocking said base-locking means when said platform frame is raised to a first predetermined position;

platform-locking means for automatically locking the platform frame to the middle frame when said platform frame is raised to a second predetermined position said second predetermined position being at least as high as the first predetermined position; and

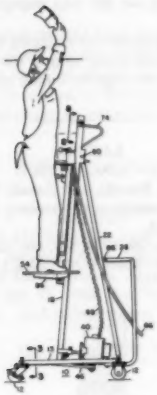
platform-unlocking means mounted on the base frame for automatically unlocking said platform locking means when said middle frame is lowered to a third predetermined position with respect to the base frame.

4,427,094

PORTABLE ELEVATOR DEVICE

Dean R. Winkelblech, Aronsburg, Pa. 16820

Filed Jul. 10, 1981, Ser. No. 282,265
Int. Cl.³ B66B 9/20
U.S. Cl. 187—9 R 4 Claims



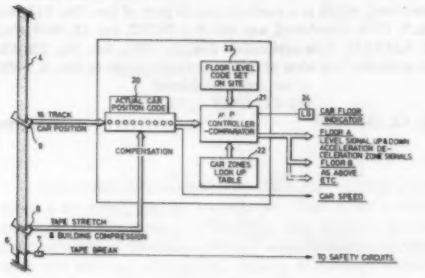
1. A movable elevator device comprising in combination:
a base member;
wheel means attached to said base member;
said wheel means being comprised of, in combination:
a wheel support member adjustably extending within said base member;
a wheel rotatably attached to wheel support member;
braking means connected to said wheel;
a clamping screw extending through said base member and bearing against said wheel support member;
an electric motor adjustably attached to said base member;
a substantially vertical screw rotatably coupled to said electric motor;
a hollow screw enclosing member attached to said base member and enclosing said screw;
a support nut rotatably engaged with said screw;
an inner slide connected to said support nut and in sliding contact with the interior surface of said screw enclosing member;
a foot platform attached to said inner slide;
a control arm connected to said foot platform;
an adjustable shelf means connected to said control arm;
said adjustable shelf means comprised of, in combination:
a shelf having a sleeve thereon, said sleeve encircling said control arm;
a thumb screw extending through said sleeve to bear against said control arm;
an elevator control switch attached to said control arm and in electrical contact with said electric motor; and
a power source connected to said elevator control switch.

4,427,095

MONITORING AND CONTROLLING LIFT POSITIONS

Reginald K. Payne, Stud Green Farm, Holyport, Maidenhead, Berkshire, and John Trett, Ranch House, Frieth, Henley-on-Thames, Oxfordshire, both of England

PCT No. PCT/GB81/00016, § 371 Date Oct. 7, 1981, § 102(e) Date Oct. 7, 1981, PCT Pub. No. WO81/02288, PCT Pub. Date Aug. 20, 1981
PCT Filed Feb. 6, 1981, Ser. No. 309,895
Claims priority, application United Kingdom, Feb. 8, 1980, 8004286
Int. Cl.³ B66B 1/36
U.S. Cl. 187—29 R 12 Claims



1. A lift position control system for controlling the position of a lift in a lift shaft which system comprises, extending vertically down the lift shaft for substantially the whole of its height, an elongate code bearing number, the member having sequentially positioned along its length the sequence of coded units of information, the system comprising means cooperating with the elongate member and adapted to detect and decode the coded markings thereon and to derive therefrom information concerning the position of the lift, means for controlling the operation of a lift drive motor in dependence upon the positional information so detected and decoded, and monitoring means to detect changes in dimensions of the elongate member and produce a compensation signal dependent thereon.

4,427,096

DEVICE FOR MOUNTING A GUIDING BOLT OF A FLOATING-CALIPER SPOT-TYPE DISC BRAKE

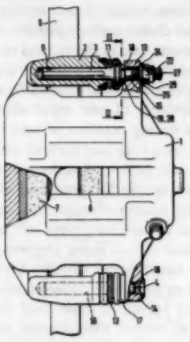
Roerto Stoka, Nauheim, and Hajo Pickel, Kelkheim, both of Fed. Rep. of Germany, assignors to ITT Industries Inc., New York, N.Y.

Filed Dec. 28, 1981, Ser. No. 334,851
Int. Cl.³ F16D 65/09
U.S. Cl. 188—73.34 7 Claims

1. A mounting arrangement for use in a spot-type disc brake including a carrier component and a caliper component for mounting on one of the components an elongated guiding bolt which is received for sliding in its axial direction in a bore of the other component and has a threaded portion disposed at the exterior of the bore, comprising
means on the one component for delimiting a recess for partially receiving the guiding bolt such that at least an end section of the threaded portion extends beyond said recess as considered axially away from the other component, said recess being open over the entire axial length thereof onto the periphery of the one component to leave a free path for the movement of the threaded bolt in a predetermined transverse direction into and out of said recess;
cooperating abutment means on the threaded bolt and on the one component for preventing the threaded bolt from

turning about its longitudinal axis when received in said recess; and

a nut threaded onto said end section of the threaded portion



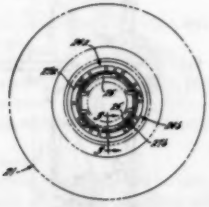
of threaded bolt and engaging the one component in its tightened condition so as to prevent movement of the threaded bolt in said predetermined transverse direction relative to the other component.

4,427,097

BRAKE DRUM

Jackson C. Medley, Brimfield, Ill., assignor to Kress Corporation, Brimfield, Ill.

Filed Feb. 19, 1981, Ser. No. 235,841
Int. Cl.³ F16D *65/10*
U.S. Cl. 188—218 R **2 Claims**



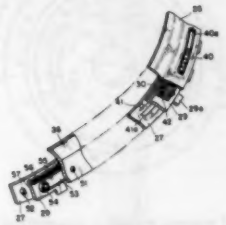
1. An improved brake drum for use in a braking system comprising a brake drum, expanding brake shoes positioned within the brake drum and means for shifting the brake shoes radially outwardly to establish frictional contact with the brake drum, the improved brake drum comprising two substantially semicircular halves, each half comprising an inwardly-facing semicircular frictional surface and an integral, outwardly-directed flange opposite an intermediate portion of the frictional surface, the flange having a plurality of axial holes therethrough to permit each of the brake drum halves to be directly and independently mounted to a continuous, circular wheel to derive hoop strength therefrom, means cooperating with said axial holes mounting said halves to said circular wheel the frictional surfaces terminating in chamfers at each end and the halves being sized to leave gaps therebetween through which grit and foreign material may be expelled.

4,427,098

TORQUE TRANSMISSION APPARATUS INCLUDING DIRECT COUPLING CLUTCH AND FLUID-TYPE TORQUE CONVERTER

Seitoku Kubo, Toyota; Koujiro Kuramochi, Okazaki, and Tatsuo Kyushima, Toyota, all of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Aichi, Japan

Filed Jun. 15, 1981, Ser. No. 273,320
Claims priority, application Japan, Aug. 20, 1980, 55-113399
Int. Cl.³ F16D *3/66*
U.S. Cl. 192—3.28 **6 Claims**



1. A torque transmission apparatus including a direct coupling clutch having first and second clutch elements and a fluid-type torque converter including a pump impeller coupled to an input shaft and a turbine runner and a stator coupled to an output shaft, comprising:

a first circular coupling element engaging said first clutch element of said direct coupling clutch and constructed to permit its movement in an axial direction relative to said first clutch element, said direct coupling clutch having said second clutch element coupled to one of said input shaft and said output shaft;

second and third circular coupling elements coupled to one another and spaced from said first circular coupling element, with said first circular coupling element interposed therebetween, said second and third circular coupling elements being constructed and arranged to allow their rotation through a given angle relative to said first circular coupling element; and

compression coil springs retained in portions of said first circular coupling element and engaging portions of said second and third circular coupling elements, to thereby absorb shock due to the relative rotation of said first circular coupling element with respect to said second and third circular coupling elements, one of said second and third circular coupling elements being coupled to the other of said input shaft and said output shaft, said compression coil spring retaining portions of said first circular coupling element and said spring engaging portions of said second and third circular coupling elements having a surface hardness substantially equal to the surface hardness of said compression coil springs.

4,427,099

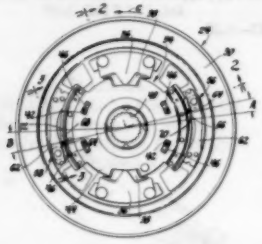
TORQUE CONVERTER CLUTCH WITH A TORQUE REVERSAL RELEASE VALVE ASSEMBLY

Richard J. Van Ee, Northville, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Oct. 23, 1981, Ser. No. 314,208
Int. Cl.³ F16D *3/66*
U.S. Cl. 192—3.29 **5 Claims**

1. A torque converter clutch and release valve assembly, subjected to either engine driven forward torque or vehicle driven reverse torque during clutch engagement, comprising; a torque converter; a clutch pressure plate disposed in the torque converter and bounded by an apply chamber on one side and a release chamber on the other side, said pressure plate engaging the input of the torque converter when the apply chamber is pressurized and the release chamber is exhausted; a vibration

damper mechanism drivingly connected between the clutch pressure plate and the torque converter; a pair of valve means disposed on said pressure plate for normally preventing communication between the apply and release chambers when forward torque is being transmitted, sequential release means on said damper mechanism comprising first actuator cam means for opening one of said valve means when a predetermined amount of reverse torque is transmitted for providing controlled fluid communication between the apply and release chambers to effectively increase the pressure level of the release chamber; and second actuator cam means for opening the other of said valve means when a predetermined increase in the amount of reverse torque from the predetermined amount is present for providing increased fluid communication between the apply and release chambers.



4,427,100

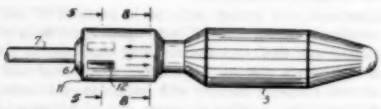
REVERSIBLE TOOL HANDLE

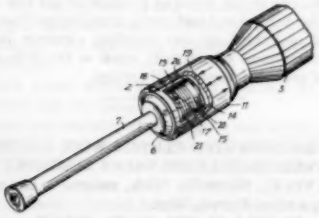
Edward T. Rude, Fairfield; Jules Nisenson, Stamford, and Martin Waine, Riverside, all of Conn., assignors to General Clutch Corp., New York, N.Y.

Filed Mar. 15, 1982, Ser. No. 358,338

Int. Cl.³ F16D *13/08, 41/20;* B25B *15/00*

U.S. Cl. 192—43 **20 Claims**





1. A bi-directional spring clutch comprising an input element, a cylindrical output element, a clutch spring, and a control element,

the clutch spring being wound in a helix whose inside diameter is slightly smaller than the outside diameter of said output element, the clutch spring being disposed about said output element,

the input element being rotatably mounted with respect to said output element and having two load surfaces,

the control element being rotatably and concentrically mounted with respect to said input element, and having two control surfaces which can be placed and maintained in at least two positions by rotating the control element with respect to said input element such that in a first of said positions a first of said control surfaces holds a first end of said clutch spring against a first load surface of said input element, and in the second of said positions a second of said control surfaces holds the second end of said clutch spring against a second load surface of said input element,

said load surfaces of said input element being configured such that during rotation of said input element in a first direction, and with said control element being in said first position, said first load surface contacts said first end of said clutch spring to cause said clutch spring to tighten about said output element for controlling said output element to rotate along with said input element, and during rotation of said input element in a second direction, and with said control element being in said second position, said second load surface contacts said second end of said clutch spring to cause said clutch spring to tighten about said output element for controlling said output element to rotate along with said input element.

4,427,101

FRICTION CLUTCH UNIT

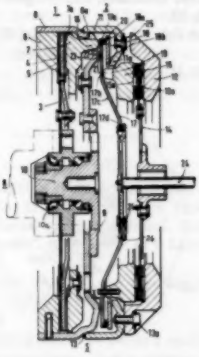
Paul Maucher, Sasbach, and Oswald Friedmann, Lichtenau, both of Fed. Rep. of Germany, assignors to Luk Lamellen und Kupplungsbau GmbH, Bühl, Fed. Rep. of Germany

Filed Apr. 2, 1981, Ser. No. 250,381

Claims priority, application Fed. Rep. of Germany, Apr. 5, 1980, 3013299

Int. Cl.³ F16D *21/00, 13/44*

U.S. Cl. 192—48.7 **43 Claims**



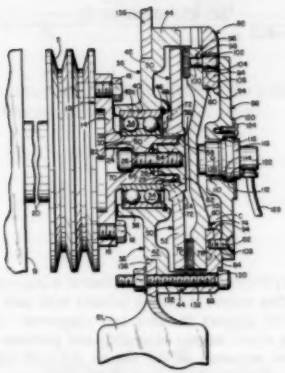
1. A friction clutch unit, comprising coaxial first and second friction clutches each of which includes an axially fixed rotary pressure plate, an axially movable rotary pressure plate and a rotary friction disc between said pressure plates; a common clutch spring interposed between said clutches, as considered in the axial direction of the clutches, said spring having a first region bearing against the axially movable pressure plate of one of said clutches and a second region disposed radially inwardly of said first region and bearing against the axially movable pressure plate of the other of said clutches in engaged condition of such clutches, said spring further having a portion disposed intermediate said first and second regions; and a fulcrum defining a substantially annular seat for said portion of said spring, said spring being pivotable with reference to said seat.

4,427,102

FLUID ENGAGED AND SPRING RETURNED FAN CLUTCH

Hugh K. Schilling, St. Paul, Minn., assignor to Horton Industries, Inc., Minneapolis, Minn.

Filed Jul. 6, 1981, Ser. No. 280,993
Int. Cl.³ F16D *13/48, 13/44*
U.S. Cl. 192—85 A 10 Claims



1. A fluid engaged spring released fan clutch comprising:
(a) an annular mounting flange for connection with a live rotative source of power,
(b) said flange terminating in a hub,
(c) an annular friction flange,
(d) means connecting said annular friction flange to said hub,
(e) a first outer shell section,
(f) means rotatively mounting said first outer shell section on said hub,
(g) a second outer shell section having a series of fan blades connected thereto,
(h) means connecting said first outer shell section to said second outer shell section for rotation therewith,
(i) a circular face plate,
(j) means securing said face plate to said second outer shell section,
(k) a circular piston,
(l) a friction material ring connected to said piston,
(m) means slideably and axially mounting said piston on and within said second outer shell section and axially of said face plate thereby forming a cylinder void between said piston and said face plate,
(n) a circular resilient bladder member,
(o) means securing the peripheral edge portion of said circular resilient bladder member between said second outer shell section and said face plate with said resilient member adjacent said piston and opposed to said face plate,
(p) spring means,
(q) means mounting said spring means between said first outer shell section and said piston for urging said friction material ring on said piston from said friction flange,
(r) means for introducing fluid pressure between said face plate and said resilient member to cause said friction material ring to engage said friction flange to thereby rotate said first and second outer shell sections and fan blades carried thereby against the action of said spring means.

4,427,103

DIAPHRAGM CLUTCH MECHANISM, PARTICULARLY FOR A MOTOR VEHICLE

Jean-Pierre Chatelin, Taverny, and Andre Caray, Paris, both of France, assignors to Valeo, Paris, France

Filed Jan. 23, 1981, Ser. No. 227,693
Claims priority, application France, Jan. 25, 1980, 80 01599
Int. Cl.³ F16D *13/71*
U.S. Cl. 192—89 B 8 Claims

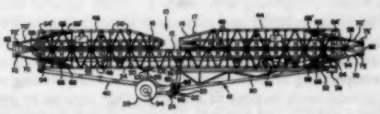
1. A diaphragm clutch cover assembly for a motor vehicle, said cover assembly comprising an annular cover, a diaphragm spring having a peripheral portion defining a cup spring and a central part divided into radial fingers, a first annular fulcrum for said diaphragm spring defined on said cover, a retaining ring for pivotally mounting said diaphragm spring on said cover, a pressure plate mounted for rotation with said cover and axially displaceable relative to the cover, said peripheral portion of said diaphragm spring bearing against said pressure plate, said retaining ring comprising a second annular fulcrum for said diaphragm spring on the side of said diaphragm spring axially remote from said cover, said retaining ring having retaining lugs formed in one-piece thereof, said retaining lugs extending axially through said diaphragm spring and fixed to said cover, each of said retaining lugs bearing in a first axial direction and in an opposite axial direction against said cover thereby tightly clamping said retaining lugs axially on said cover.

4,427,104

RADIAL STACKER

Edwin W. Reid, Jr., Prineville, Oreg., assignor to Reid Bros., Inc., Prineville, Oreg.

Filed Jul. 14, 1981, Ser. No. 283,279
Int. Cl.³ B65G *41/00*
U.S. Cl. 198—306 7 Claims



1. A highway transportable radial stacker, comprising:
(a) an elongate conveyor having an elongate main portion and at least one elongate end portion hingedly interconnected therewith;
(b) wheeled carriage means for transporting said conveyor, said carriage means including means for holding said conveyor in either a raised operating configuration or a lowered transport configuration of said stacker;
(c) a set of wheels and variable-width means for selectively positioning said wheels in either a widely spaced operat-

ing configuration or a closely spaced transport configuration; and

(d) at least one folding mechanism means for selectively moving a respective elongate end portion of said conveyor between an extended position coaxial with said elongate main portion thereof and a folded position generally parallel with and adjacent to said elongate main portion thereof, said folding mechanism means including an intermediate lever arm located between said elongate main portion and said respective elongate end portion, said intermediate lever arm having first and second ends, said first end of said intermediate lever arm being pivotably interconnected with at least one of said elongate main portion and said respective elongate end portion, said folding mechanism means further comprising a pair of extensible motor means, one of said extensible motor means interconnecting said main portion and said second end of said intermediate lever arm and the other of said extensible motor means interconnecting said respective elongate end portion and said second end of said intermediate lever arm, for pivoting said elongate end portion with respect to said main portion.

4,427,105

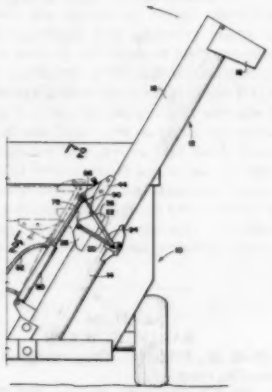
AUGER CASING LATCHING MECHANISM

Laird V. Hawley, and Eugene T. Logan, both of Claremore, Okla., assignors to Parham Industries, Inc., Claremore, Okla.

Filed Sep. 18, 1981, Ser. No. 303,420

Int. Cl.³ B65A *33/32*

U.S. Cl. 198—632 **8 Claims**



1. In combination with an auger casing having at least two separable sections hingedly secured together, latching mechanism means comprising arm means pivotally secured to one of said sections, cylinder and reciprocal piston rod means operably connected between the other of said sections and the pivotal arm means, spring means carried by the pivotal arm means and cooperating with the piston rod means for pivoting of said one section with respect to the said other section to provide alternate aligned and stowage positions therebetween, second reciprocal rod means secured to the arm means for actuation thereby upon the application of sufficient pressure against the arms means for overcoming the force of the spring means, tube means reciprocally receiving the second rod means therein, latching linkage means pivotally secured between the said one section and the outer end of the tube means and actuated by the reciprocation of the second rod means with respect to the tube means, eccentric means secured to the other section in approximate alignment with the latching linkage means for alternate engagement and disengagement thereby for locking the sections in the aligned position therebetween and releasing the engagement therebetween for movement of the sections to the stowage position.

4,427,106

MEANS FOR SUPPORTING IDLER ROLLERS IN CONVEYOR SYSTEMS

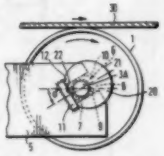
Lawson C. Wooldridge, Stourbridge, England, assignor to Brockway Engineering Limited, England

Filed Feb. 12, 1982, Ser. No. 348,359

Claims priority, application United Kingdom, Feb. 20, 1981, 8105440

Int. Cl.³ B65G *39/10*

U.S. Cl. 198—842 **9 Claims**



1. A conveyor system including a frame; a conveyor belt; a plurality of idler rollers in rolling contact with said conveyor belt to provide support therefor and supported within said frame on axle shafts having extending end portions engaging support means mounted on the frame, the said idler rollers being freely rotatable about said shafts, said support means including a bracket attached to the said frame and having formed therein a locating slot extending downwardly at an angle to the horizontal, the said slot having a closed lower end and being dimensioned to receive the said end portion of a shaft to support one said roller in said frame; a reaction member positioned adjacent the closed end of said slot and extending outwardly of said frame to provide a reaction surface substantially parallel to the axis of the said shaft, when the shaft is engaged in the said slot; a cam member non-rotatably carried on said extending end portion of said shaft for engagement with said reaction surface, said cam member having a maximum dimension at right angles to the shaft axis greater than the depth of said slot and having a portion of its surface engaging said reaction surface that cooperates therewith to resist rotation of the said cam when the shaft is engaged in the said slot, rotation of the said cam against said resistance moving the shaft along the said slot in the direction of the open end thereof to drop from said open end to disengage the shaft from the support bracket, whereby the roller supported by the said shaft moves out of contact with the said belt and ceases to provide support therefor.

4,427,107

BELTING

Michael J. Roberts, Little Weighton, and Keith Saul, Hedon, both of England, assignors to J. H. Fenner & Co. Ltd., North Humberside, England

Filed May 12, 1980, Ser. No. 148,831

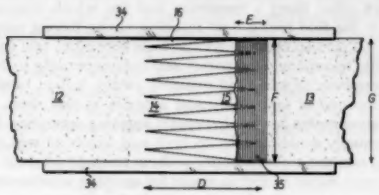
Claims priority, application United Kingdom, May 19, 1979, 7917516

Int. Cl.³ B65G *15/30*

U.S. Cl. 198—844 **24 Claims**

1. A splice-jointed belting comprising belting including a spliced joint and a protective covering comprising a knitted breaker fabric completely covering the joint, the breaker fabric having substantially different stretch characteristics in the directions of the wales and courses, said breaker fabric being positioned on the spliced joint so that the thread in the direction of the wales of the breaker fabric lies in the transverse plane of the belting and the thread in the direction of the courses of the breaker fabric lies in the longitudinal plane of the

belting whereby the low elongation wales serve to hold the spliced joint firmly in place while the breaker fabric is able to



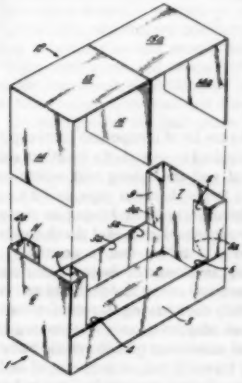
flex freely in the longitudinal direction of the belting due to the high courses elongation of the breaker fabric.

4,427,108

STACKABLE DISPLAY UNIT

Robert E. Coles, Leamington Spa; Douglas R. Compton, Chalfont St. Giles; Jack Lawrence, Dartford, and William A. Carpenter, Aveley, all of England, assignors to General Foods Limited, Banbury, England

Filed Feb. 24, 1982, Ser. No. 351,802
Int. Cl.³ B65D *5/48, 25/04, 71/08*
U.S. Cl. 206—44 R **3 Claims**



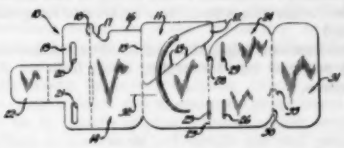
1. A display unit composed from a blank comprising an elongated tray with walls which define a region accomodating a batch of sachets, said blank when folded forms a tray comprising a single base (2), longitudinal side walls (3,3*a*) which are partly double walls formed by side flaps (4,4*a*,5,5*a*) overlapping with and effectively forming part of the longitudinal side walls (3,3*a*) and front and rear walls (6,7) which are higher than the longitudinal side walls (3,3*a*), the side flaps (4,4*a*,5,5*a*) have lateral slits at a height the same as that of the longitudinal side walls (3,3*a*) and to a width approximately half that of the flap, said flaps when turned inward form tabs (8,9,10,11), said tabs being capable of providing support to another display unit placed above.

4,427,109

CENTERING FOLDER RETAINER FOR NEEDLED SUTURES

Constance E. Roshdy, North Brunswick, N.J., assignor to Ethicon, Inc., Somerville, N.J.

Filed Jun. 2, 1983, Ser. No. 500,463
Int. Cl.³ A61L *15/00*
U.S. Cl. 206—63.3 **8 Claims**



1. A needled suture retainer comprising:
first and second needle retainer panels, said panels each having a generally rectangular shape and said panels being foldably connected to each other at a common longitudinal edge,
a suture winding panel, said panel having two suture winding holes disposed inwardly from the edges of said panel and said panel foldably connected to the second needle retainer panel along the longitudinal edge opposite the longitudinal edge connected to the first needle retainer panel,
a suture retainer panel foldably connected to the suture winding panel along the edge opposite the edge connected to the second needle retainer panel,
the width of the suture winding panel being less than the width of the second needle retainer panel and the width of said second needle retainer panel being less than the width of the first needle retainer panel,
first and second suture protector panels, each panel having a generally rectangular shape, said first suture protector panel foldably connected to the first needle retainer panel along the longitudinal edge opposite the longitudinal edge connected to the second needle retainer panel,
two suture winding holes disposed in the foldably connected edge between the first needle retainer panel and the first suture protector panel, said holes being disposed so as to underlie the holes in the suture winding panel when the second needle retainer panel and the suture winding panel are folded on top of the first needle retainer panel, said second suture protector panel foldably connected to the first suture protector panel along the longitudinal edge opposite the longitudinal edge and connected to the first needle retainer panel,
the width of said second suture protector panel being less than the width of said first suture protector panel whereby a needled suture, when packaged in said retainer and said retainer is folded the needle and suture are retained in separate compartments and the suture is disposed inwardly from the edges of said folded retainer.

4,427,110

APPARATUS AND METHOD FOR HANDLING USED DISPOSABLE DIAPERS

Kenneth N. Shaw, Jr., c/o Samual Curcio, Esq., P.O. Box 593, Hammonton, N.J. 08037

Filed Aug. 23, 1982, Ser. No. 410,567
Int. Cl.³ B65D *81/24*
U.S. Cl. 206—205 **3 Claims**

1. An apparatus for handling used disposable diapers comprising a canister base means including a rim;
a seal insert means supported by said rim of said canister base and having a structure defined by a plurality of radially disposed slits intersecting generally centrically to provide flexible sliced pre-shaped sectors adapted to be flexed

downwardly into the top of said canister base by a downward force and to spring back into the plane of the seal insert upon release of the downward force;

a top means having a generally depending top flange to engage the seal insert means against the rim of said canister base means and a generally frusto-conical plunger means integrally bound thereto and adapted to flex the sliced pre-shaped sectors downward when forced thereagainst;

a deodorant receptacle means bound to said top means;

a deodorizer means positioned within said receptacle means; and

a handle means engaged to said receptacle means and having a perforate base for venting odors from the deodorizer means,

said deodorant receptacle means comprises a flanged perimeter extending into the receptacle for reducing the diameter of the receptacle means, said flanged perimeter including a pair of diametrically opposed slots,

said handle means additionally comprises a pair of lugs bound to the bottom of said perforate base which are adapted for insertion through the slots for lodging underneath the flanged perimeter of the deodorant receptacle means when the handle means is rotated in order to secure the handle means to the deodorant receptacle means,

the seal insert means additionally comprises a depending seal flange,

said depending top flange additionally includes a hinge element means bound thereto, and said canister base comprises a yoke means secured to the sides thereof of securing said hinge element means to pivot the top means about said yoke means.

4,427,111

INTEGRAL ALCOHOL PREPARATION DEVICE AND METHOD

Thomas C. Laipply, 13530 Fox Den East, Russell, Ohio 44072

Filed Oct. 19, 1981, Ser. No. 312,880

Int. Cl.³ B65D *83/00, 75/00;* **A61B** *17/20*

U.S. Cl. 206—210 **25 Claims**

1. A combined fluid storage and application device comprising a single integral sheet of fluid impermeable material folded in generally symmetrical halves over on itself along a fold line positioning said halves in generally flat parallel overlying relation to each other, temporary seal means sealing said halves to each other along a temporary seal line which begins and ends at the fold line, a fluid retaining cavity having substantially flat parallel opposed wall surfaces formed by said halves, said fold line and said temporary seal line cooperating to define the periphery of said fluid retaining cavity, a fluid retaining pad disposed in said cavity and adhered to said sheet, and separation means for simultaneously applying separating force substantially symmetrically to both said halves of said sheet and to said temporary seal line without tearing said sheet, said separation means including means for applying simultaneously continuous separating force in multiple directions to open said sheet from folded condition fully exposing said cavity and said pad while the integrity of said sheet is maintained.

4,427,112

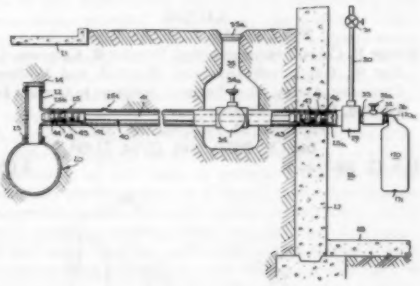
SERVICE LINE INTERIOR BY-PASS KIT

Bernard A. Di Giovanni, 96 Davis Ave., Hauppauge, N.Y. 11787, and Francisco J. Ciminiello, 21 Victor La., Woodbury, L. I., N.Y. 11797

Division of Ser. No. 181,671, Aug. 27, 1980, which is a division of Ser. No. 955,990, Oct. 30, 1978, abandoned. This application Sep. 24, 1982, Ser. No. 423,304

Int. Cl.³ B65D *69/00*

U.S. Cl. 206—223 **6 Claims**



1. An adapter kit of component parts capable of being assembled and attached to an end of a length of tubing to expandably connect and seal the tubing end within and to the interior surface of a larger diameter pipe, said kit comprising a generally cylindrical inner body having an elongated forward end and an opposite shank end, said shank end being adapted to be attached to said tubing end, a generally cylindrical middle body having an elongated forward end and a rearward end, said rearward end of the middle body and said forward end of the inner body each having thereon the respective of comating thread means adapted to connect them together and to provide longitudinal movement of said middle body on and along said inner body forward end, at least one of said inner and middle bodies being adapted to provide a gas-leakage passage extending from the interior to the exterior thereof when said bodies are so connected together, said inner body further having a peripherally extending and outwardly projecting gasket-expander shoulder located between its said elongated forward end and its said shank end, and said middle body further having first and second peripherally extending and outwardly projecting gasket-expander shoulders the first of which faces said inner body gasket-expander shoulder when said inner and middle bodies are so connected together and the second of which is located between said middle body rearward and forward ends, a pair of radially expandable sealing gaskets respectively adapted to be mounted on said forward end of said inner body and on said forward end of said middle body respectively adjacent to said inner body gasket-expander shoul-

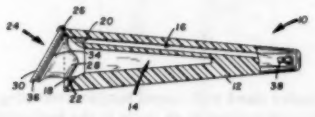
der and to said second gasket-expander shoulder of the middle body, a substantially cylindrical end cap, said cap and said forward end of said middle body each having thereon the respective of comating thread means adapted to connect them together and to provide longitudinal movement of said cap on and along said middle body forward end, said cap having a peripherally extending shoulder adapted to face said second gasket-expander shoulder of the middle body when said cap and said middle body are so connected together, whereby, when said inner and middle bodies and said cap are so connected and respectively moved longitudinally together and said gaskets are mounted respectively on said inner and middle body forward ends, each of said sealing gaskets is expanded radially by its engagement substantially with and between its adjacent cofacing pair of gasket-expander shoulders responsive to said movement such that its outside diameter becomes larger than the outside diameters of said substantially cylindrical inner and middle bodies, said gas-leakage passage having an exterior end terminus located between said pair of gaskets when so expanded.

4,427,113

MUSICAL INSTRUMENT CASE

John H. Wanner, 4833 W. Washington, Las Vegas, Nev. 89107

Filed Sep. 2, 1981, Ser. No. 298,900
Int. Cl.³ A45C *11/24, 11/00*; B65D *85/00*
U.S. Cl. 206—314 **35 Claims**



18. A musical instrument case for storage of an instrument having a bell at one end thereof comprising:

a body forming a storage compartment therein, said storage compartment forming a mouth, a portion of said instrument for total insertion in said storage compartment with said bell residing proximate to said mouth, said storage compartment being contoured and shaped to conform substantially to said instrument to be disposed therein, the exterior of said body being contoured and shaped to approximate the general shape of the instrument to be contained therein;

a lid for selectively opening and closing the mouth of said storage compartment, said lid comprising a hollow body portion and a cover portion, said hollow body portion being shaped to fit substantially within said bell of said instrument when said lid closed said mouth, said body portion forming a storage chamber therein, access to said storage chamber being selectively provided; and

means for selectively mounting said cover portion of said lid to said body over said mouth thereof, said selective mounting means comprising at least one fastener and hinge means for hingedly affixing said lid to said body.

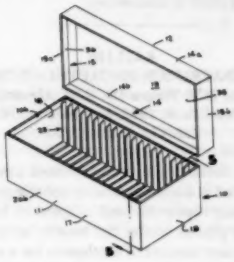
4,427,114

PROTECTIVE PACKAGING CONTAINER FOR ELECTROSTATIC DISCHARGE SENSITIVE DEVICES

George L. Howell, and Gregg F. Lambrix, both of Elmira, N.Y., assignors to F. M. Howell & Company, Elmira, N.Y.

Filed May 9, 1983, Ser. No. 492,782
Int. Cl.³ B65D *73/02, 85/42*
U.S. Cl. 206—328 **15 Claims**

1. A protective box-like container for protecting electrostatic discharge sensitive devices of generally planiform configuration from damage by electrostatic discharge events, comprising a lower box-shaped container section and a top cover section shaped to interfit thereon as a top closure, the lower box-shaped container section comprising an inner box-board blank core of elctrically surface and volume conductive paperboard material, shaped and erected to define a bottom panel and upright side wall panels and end wall panels adjoining the side wall panels defining corners of the box section, the outer surfaces of said bottom, side wall and end wall panels being covered throughout by an electrical surface and volume conductive paper overwrap throughout the exterior surface thereof having electrical surface resistance in the range of about 10^3 to 10^5 ohms per square, the paperboard material forming the inner paperboard core having electrical surface and volume conductivity properties such that the electrical surface resistance thereof lies in the "conductive" or "static" dissipative electrical resistance ranges of about 10^3 to 10^9 ohms per square and its volume resistance being low enough to substantially avoid capacitive coupling effects and high enough to dissipate fields, and an anti-static plastic insert filler shaped to lie in closely abutting relation against inwardly facing surfaces of the bottom and upright side wall panels of said box blank member, the insert filler having formations



shaped to hold the electrostatic discharge susceptible devices in predetermined position and the plastic material of said insert filler being an anti-static plastic having electrical surface resistance in the range 10^9 to 10^{14} ohms per square; the electrical resistance of said paperboard material being at a value intermediate between the electrical resistance values of said paper overwrap and said anti-static plastic; and said top cover section being formed of a paperboard core of material like the lower box section having a paper overwrap entirely covering the exterior surfaces thereof and electrically conductively contacting the paper wrap of the lower box section when in closed position thereon, the paperboard core and paper outer wrap of the cover section having similar electrical conductivity properties respectively to the paperboard core and paper overwrap portions of the lower box section, whereby during charge redistribution conditions of the container the path of least electrical resistance is around the walls of the container and not through the devices packaged therein and all parts of the container are groundable to ensure charge bleed-off when the container is in engagement with a grounded surface.

4,427,115

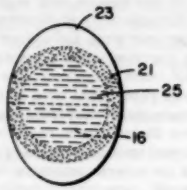
ONE PIECE ALCOHOL PREPARATION DEVICE

Thomas C. Laipply, 13530 Fox Den E., Russell, Ohio 44072

Filed Oct. 19, 1981, Ser. No. 312,879
Int. Cl.³ B65D *83/00, 75/00*; A61B *17/20*
U.S. Cl. 206—484 **17 Claims**

1. A combined fluid storage container and applicator device for relatively inviscid fluids such as alcohols and iodine, said device comprising a single integral sheet of fluid impermeable material folded in generally symmetrical halves over on itself along a fold line positioning said halves in flat parallel overlying relation to each other, temporary seal means sealing said halves to each other along a temporary seal line beginning and ending at said fold line forming a cavity enclosing fluid between said halves and within said temporary seal line and said fold line, a fluid comprising at least one of alcohol and iodine in said cavity, and separation means for simultaneously apply-

ing separating force substantially symmetrically to both said halves of said sheet and to said temporary seal means without tearing said sheet, said separation means including means for



applying simultaneously continuous separating force to open said temporary seal means along the entire length of said seal line to form a flat surface covered with the fluid while the integrity of said sheet is maintained.

4,427,116

DENITRIFICE ENCAPSULATION

Walter L. Brown, 2630 Wagon Dr. #3B, Alexandria, Va. 22303

Filed Feb. 8, 1982, Ser. No. 346,742
Int. Cl.³ B65D *85/56*
U.S. Cl. 206—530 **1 Claim**

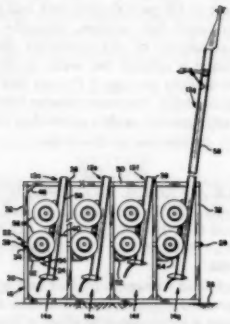
1. A capsule containing a predetermined amount of toothpaste encapsulated in a non-toxic, semi-soluble gelatin material, said capsule being rupturable and adapted to be ruptured by the teeth when placed within the mouth of a user, thereby releasing a sufficient amount of toothpaste for a single brushing of the teeth, said capsules being gelatin material having an imperviousness enclosing said toothpaste having an aqueous content of less than ten percent water but which readily dissolves within the higher liquid environment of the mouth.

4,427,117

SIDE-LOADING CONTAINER CHASSIS STORAGE RACK

Randall W. Matthewson; Earl H. Benefiel, and Ronald A. Brudi, all of Longview, Wash., assignors to Brudi Equipment, Inc., Kelso, Wash.

Filed Sep. 8, 1981, Ser. No. 300,261
Int. Cl.³ A47F *7/00*
U.S. Cl. 211—13 **14 Claims**



1. A side-loading rack for storing wheeled container chassis having an elongated chassis frame projecting forwardly from rear, ground-engaging wheels, the rack comprising:

rack frame means defining a plurality of stalls, including first and second upright frame means spaced laterally apart to define a side of each stall and to form an opening on one side of the rack for receiving a container chassis sideways in a generally vertical orientation;

a first chassis support means at one side of each stall for supporting the rear wheels of the chassis on the first frame means above ground level; and

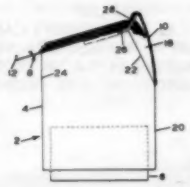
a second chassis support means at the opposite side of each stall and at a level spaced above the first support means for supporting a forwardly-projecting portion of the container chassis frame in a generally upright position with the wheels of the chassis supported against the first support means.

4,427,118

CARPET DISPLAY STAND

James L. Corrigan; Deborah L. Howett, both of Lancaster, and Gerard M. Schouten, Lititz, all of Pa., assignors to Armstrong World Industries, Inc., Lancaster, Pa.

Filed Sep. 2, 1981, Ser. No. 298,588
Int. Cl.³ A47F *7/16*
U.S. Cl. 211—45 **5 Claims**



1. A display stand with carpet samples consisting of:

(a) a flat top inclined at an angle to the horizontal,

(1) at one end of said top there being a clamping means for holding carpet samples on said top with said samples restrained at one end thereof,

(2) at the opposite end of said top there being a portion of the top uncovered by said carpet samples and said portion of said top uncovered having means for supporting descriptive material thereon; and

(b) a base for supporting said flat top,

(1) said base having a first part which supports the flat top on the upper end thereof, and a second part which telescopes inside said first part at the lower end thereof and means of releasably retaining said second part within said first part at various positions relative to the lower end of the first part,

(2) said first part having four parallel vertical sides and a top surface inclined to position said flat top in an inclined position, said one vertical side, adjacent the one end of said top having said carpet clamping means, having the upper end portion thereof inclined away from the plane of that said one vertical side in a direction towards the opposite vertical side whereby the one end of said flat top is spaced several inches away from the vertical plane of said one vertical side and said one end of said flat top is spaced over the main portion of the body of the base and not the one vertical side with the inclined upper end.

4,427,119

HIDEAWAY TIE RACK FOR SLIDING DOOR CLOSETS

Joseph Savino, 955 Ironbark Dr., Port Richey, Fla. 33568

Filed Jun. 4, 1981, Ser. No. 270,253
Int. Cl.³ A47F *7/12*
U.S. Cl. 211—94 **7 Claims**

1. A hideaway tie rack for a sliding door closet, comprising:

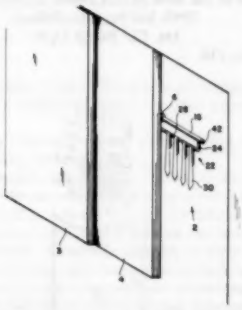
an elongated, hollow cylindrical housing having an inner diameter of a first dimension, having a first open end and a second opposed end, with a longitudinal slot extending axially along the surface thereof having a circumferential

width and opening onto said first end, for mounting with the cylindrical axis thereof in a substantially horizontal orientation on said sliding door;

an elongated cylindrical tube having an outer diameter of a second dimension less than said first dimension, having a first end and a second opposed end which slideably enters said first end of said housing, for mounting within the hollow interior of said housing in axially slideable engagement therewith;

a bar having a cross sectional dimension less than said circumferential width of said slot in said housing, with a first end mounted to said first end of said tube, a second end mounted to said second end of said tube, and an intermediate horizontal rack portion between said first and second ends thereof suspended in spaced, parallel relationship with said tube and projecting through said slot in said housing and in axially slideable engagement therewith;

said bar further comprising:



a first axial projection from said first end thereof directed away from said intermediate portion;

a second axial projection from said second end thereof directed away from said intermediate portion in the opposite direction from that of said first projection;

said tube having a first mounting hole through the side thereof at said first end thereof for inserting said first axial projection therein;

said tube having a second mounting hole through the side thereof at said second end thereof for inserting said second axial projection therein;

whereby neckties may be hung from said horizontal rack portion of said bar when said tube extends out from said first end of said housing in a deployed position and then said tube can be substantially completely slideably inserted into said housing to form a more compact tie rack which can be concealed behind said door to enable said door to be closed.

4,427,120

FOLDING POLE TRUCKBED

William N. Schoeffler, Apt. #8, 3600 E. Simcoe, Lafayette, La. 70501

Filed Apr. 24, 1981, Ser. No. 257,367
Int. Cl.[3] B66C *23/42*
U.S. Cl. 212—186 **9 Claims**

1. In a truckbed having a folding gin pole thereon, the improvement comprising:

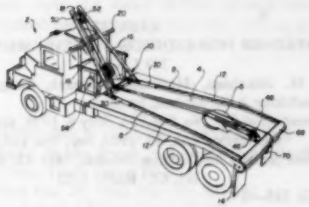
a gin pole assembly pivoted at one end thereof about a first transverse axis to the rear end of said truckbed to extend forwardly thereon;

said assembly comprising a forwardly tapered rear portion and a forward portion pivotally joined together on a second transverse axis;

fixed means holding said forward portion in a generally upright position when said rear portion lies on said truckbed;

first pulley means journalled on said truckbed adjacent said first axis, second pulley means journalled on said assembly adjacent but forwardly of said second axis and third pulley means journalled on said assembly adjacent the upper end of said forward portion;

winching means on the front portion of said truckbed and a cable having a first run extending rearwardly therefrom,



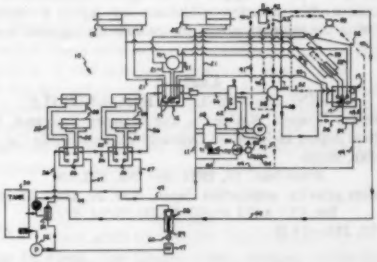
around said first pulley means, a second run extending forwardly and under said second pulley means, upwardly and around said third pulley means, upwardly and around said third pulley means and a third run extending downwardly and under said second pulley means and rearwardly therefrom, the rear end of said third run being releasably secured to said truckbed the upper surface of said truckbed being provided with channels arranged to receive said rearward portion of said assembly.

4,427,121

HYDRAULIC VALVE CONTROL FOR AERIAL BOOK DEVICES

Shannon K. Clements, 6216 Locust Dr., Evansville, Ind. 47712

Filed May 3, 1982, Ser. No. 374,042
Int. Cl.[3] B66C *23/04, 13/18, 23/26, 23/56*
U.S. Cl. 212—231 **6 Claims**



1. In a hydraulic control system for an aerial boom, mounted on a vehicle and including a turntable, adjustable outriggers, drive means for rotating said turntable about its axis, a lower boom pivotally connected at a first end thereof to said turntable, an upper boom pivotally connected at a first end thereof to a second end of said lower boom, a basket carried by a second end of said upper boom, a winch mounted on one of said aerial booms, a hydraulically extendable lower boom ram interconnecting said lower boom and said turntable, a hydraulically extendable upper boom ram interconnecting said upper boom and said lower boom, a hydraulic control system including a fluid tank, a main pressure line in fluid connection with said fluid tank, a pump for maintaining fluid pressure in the pressure line, a plurality of manually operable valve means interposed in said pressure line and respectively controlling actuation of said turntable drive means, winch, outriggers and said boom rams, first return fluid lines extending from said valve means and

connected to said main pressure line for carrying fluid to said tank when said valve means are in an unactuated position, the improvement comprising means connected to said main pressure line and operative to divert fluid from said first return lines upon operation of at least one of said manual valves means, second return lines for returning said diverted fluid to said tank, pressure responsive valve means interposed in said first return lines, and pump drive means having a speed control, said pump speed control increasing the speed of the pump in response to a pressure drop in said first return lines, whereby selected fluid pressure is maintained in said pressure line.

4,427,122

CONTAINER FOR LIQUIDS, WHICH ARE SENSITIVE TO LIGHT

Kjell M. Jakobsen, Hjallese, Denmark, assignor to Platmanufaktur A.B., Malmo, Sweden

Continuation of Ser. No. 903,734, May 8, 1978, abandoned. This application Jan. 10, 1980, Ser. No. 111,011

Claims priority, application Sweden, May 13, 1977, 7705605

Int. Cl.³ B65D *1/02*

U.S. Cl. 215—1 C **6 Claims**

1. A container comprising at least two layers of plastic material formed from a composite parison, which after heating is expanded by internal pressure into the form of the finished container with its attendant properties, the plastic material of the inner layer of the parison containing aluminum powder for reflecting and providing protection against admission of light and comparable radiation while also serving as a means for increasing the temperature of the parison during said heating.

4,427,123

STAINLESS STEEL THERMOS BOTTLE

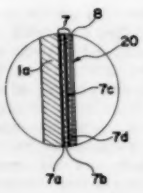
Masakatsu Komeda, Kashihara, and Mamoru Fujiyama, Nara, both of Japan, assignors to Zojirushi Vacuum Bottle Co., Ltd., Osaka, Japan

Filed Nov. 19, 1981, Ser. No. 322,928

Claims priority, application Japan, Nov. 20, 1980, 55-167311

Int. Cl.³ A47J *41/02;* **B65D** *25/14, 81/38*

U.S. Cl. 215—13 R **2 Claims**



1. A stainless steel thermos bottle comprising inner and outer bottles made of stainless steel, each of said bottles having inner and outer surfaces, said inner and outer bottles being joined together at tip portions of their bottle necks to form a double-walled construction with a space therebetween, said thermos bottle having a vacuum present in the space created between the inner and outer bottles, said thermos bottle being characterized in that the surfaces of the inner and outer bottles surrounding said space are provided with a metal deposit on at least the outer surface of the inner bottle, except for that portion of the bottle neck surfaces in the area which includes the surface of the joint between the two bottles, said metal deposit comprising, in order of deposition, a strike nickel layer, a semi-bright nickel layer, a tri-nickel layer, a bright nickel layer, and an outer layer selected from the group consisting of silver and copper.

4,427,124

CHILD-RESISTANT CONTAINER

Francis G. Marshall, Meriden, and Edward F. Klimeck, Waterbury, both of Conn., assignors to Eyelet Specialty Co., Inc., Wallingford, Conn.

Continuation-in-part of Ser. No. 704,690, Jul. 12, 1976, Pat. No. 4,069,942. This application Jun. 8, 1977, Ser. No. 804,592

The portion of the term of this patent subsequent to Jan. 24, 1995, has been disclaimed.

Int. Cl.³ B65D *55/02*

U.S. Cl. 215—216 **5 Claims**

1. A container with safety closure, comprising: a container-body member having a dispensing opening at one end and including an upstanding circular body wall with external thread formations at a threaded region which is axially above an unthreaded region, and a closure-cap member including a skirt with internal threads for selective engagement with said body-wall threads; said cap-member skirt having plural radially-inwardly directed ratchet teeth axially beneath the threads thereof, said ratchet teeth being at a location of axial overlap with said unthreaded region of said body wall when said cap is thread-engaged to said body member, said container-body member comprising an inner upwardly open body portion having said threaded region, said body member further integrally including a downwardly extending body-member skirt connected at its upper axial end to said body portion at a location beneath said threaded region, said body-member skirt otherwise extending circumferentially of and in radial clearance with said body portion, said body-member skirt having at one angular location and in the axial region of said cap-member skirt a radially inwardly compliant portion whereby said inwardly compliant portion may be transiently and resiliently inwardly displaced, said radially inwardly compliant portion being essentially only radially inwardly displaceable, and a ratchet-locking tooth formation integrally formed with said compliant portion, said tooth formation being inwardly displaced upon such inward displacement of said compliant portion and having (a) ratchet-escaping engagement with cap-member teeth in the thread-on direction of cap-member threaded engagement with said base member and (b) ratchet-

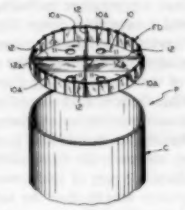
locking engagement with said cap-member teeth in the thread-off direction of such threaded engagement.

4,427,125

FOOD DEPRESSOR TYPE LID

Milton J. Tuitt, Sunnyvale, Calif., assignor to Container Corporation of America, Chicago, Ill.

Filed Jun. 18, 1982, Ser. No. 389,574
Int. Cl.³ B65D *51/26*
U.S. Cl. 215—231 **6 Claims**



1. A food depressor type lid for a tubular container, said lid being formed of a unitary blank of foldable paperboard and comprising:

(a) a horizontally disposed central panel having at least one opening extending therethrough;

(b) an outer rim section including a plurality of integral flanges foldably joined to the outer edge of said central panel and extending generally normal thereto for frictional engagement with an inner surface of a tubular container;

(c) a plurality of pairs of radially aligned, vertically disposed, transversely extending, reinforcing rib members projecting upwardly from the upper side of said central panel;

(d) a first pair of said rib members having opposed male lock tabs disposed at its radially inner ends;

(e) a second pair of said rib members having opposed female lock tabs disposed at its radially inner ends; and

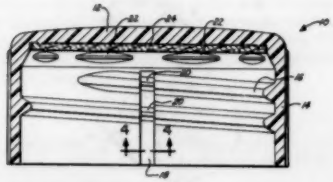
(f) each of said opposed male lock tabs having an enlarged head portion and a reduced neck portion, each of said opposed female lock tabs having a slot located adjacent its respective rib member, said male lock tabs being received within said slots of said female lock tabs for interlocking engagement.

4,427,126

VENTED CLOSURE

Efrem M. Ostrowsky, Highland Park, Ill., assignor to Ethyl Products Company, Richmond, Va.

Filed Jun. 8, 1981, Ser. No. 271,776
Int. Cl.³ B65D *51/16*
U.S. Cl. 215—307 **4 Claims**



1. In a thermoplastic closure suitable for fitment to a threaded container neck wherein the closure includes:

(a) a top wall,

(b) an annular sidewall downwardly depending from the top wall,

(c) a closure thread carried on the inside surface of the annular sidewall for cooperation with the container neck thread,

(d) a sealing system above the closure thread for effecting a gas-tight seal between the closure and the container, and

(e) at least one venting groove in the sidewall traversing the closure thread,

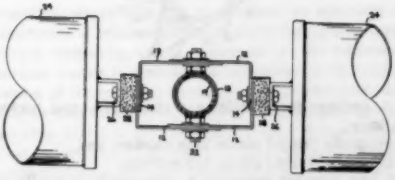
the improvement which comprises a rigidifying means at each point of traverse by said venting groove of said closure thread, said rigidifying means being dimensioned so that it has a perpendicular height measured from the inside surface of said sidewall less than the perpendicular height of said closure thread measured from the inside surface of said sidewall, whereby pressurized gas can pass through said venting groove to the atmosphere as said closure is removed from said container.

4,427,127

FLOATING DECK SUPPORT APPARATUS

Dean J. Kalkowski, Saddle Brook, N.J., assignor to Mayflower Vapor Seal Corp., Little Ferry, N.J.

Filed Jun. 29, 1982, Ser. No. 393,453
Int. Cl.³ B65D *88/34, 88/40*
U.S. Cl. 220—218 **8 Claims**



1. For use with a deck adapted to float on the surface of liquid in a storage tank, the combination comprising:

first and second generally horizontal elongated pontoons disposed along a common axis of elongation and adapted to float support said deck on said surface;

a vertical hollow member open at top and bottom disposed between said pontoons, said member in horizontal cross section having a generally rectangular shape;

a vertical sleeve extending downwardly through the hollow interior of said member and secured thereto; and

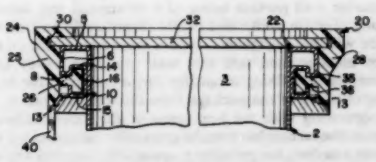
first and second means, each of the first and second means resiliently and flexibly securing the end of the corresponding one of the first and second pontoons adjacent said member to said member, the first and second means being disposed on opposite sides of said member.

4,427,128

CAN AND CLOSURE THEREFOR

William M. Heyn, New Canaan, Conn., assignor to The Continental Group, Inc., Stamford, Conn.

Filed Oct. 13, 1982, Ser. No. 434,156
Int. Cl.³ B65D *17/34*
U.S. Cl. 220—270 **6 Claims**



1. A closure for a can and the like wherein the can has a

body wall and an upper edge channel formation thereabout providing a seal-means-receiving gap therein,

a cap fitted over said upper edge portion and having sealing means entered into said channel formation through said gap in a sealtight fit therewith,

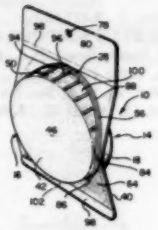
said sealing means being adapted to be torn apart attendant to lifting off of said cap to open the can.

4,427,129

COMMESTIBLE PACKAGE

Ihor Wyslotsky, and Robert E. Tischer, both of Alsip, Ill., assignors to TEC, Inc., Alsip, Ill.

Filed May 15, 1981, Ser. No. 263,871
Int. Cl.³ B65D *41/18, 1/40*
U.S. Cl. 220—306 **18 Claims**



1. A package for containing a comestible, said package comprising:

an integrally formed plastic base member; and

an integrally formed plastic top member;

said base member including a substantially centrally disposed comestible receptacle for receiving and supporting the comestible, said comestible receptacle having a transverse cross-sectional shape which is substantially congruent with the transverse cross-sectional shape of the comestible for a substantially snug fit of the comestible therein, said comestible receptacle having a supporting bottom portion and side wall portions connected to said bottom portion, an oppositely disposed pair of said wall portions being of a greater height than the side wall portions normally thereto to form oppositely disposed side wall peak areas and oppositely disposed side wall valley areas disposed normal thereto with said side wall portions decreasing in height from the side wall peak areas to the side wall valley areas, said side wall peak and valley areas comprising means for resisting crushing of the package from the top and bottom, for guiding the comestible thereinto during filling, for providing oppositely disposed top and bottom access means for withdrawal of a portion of the comestible, and for holding the bulk of the comestible therein upon opening and removal of a portion of the comestible;

an upwardly projecting engagement lip, said lip having an inside wall formed from said side wall, a lip top portion disposed substantially normal thereto, and an exterior wall connected to said lip portion and extending downwardly therefrom, said lip continuously disposed around the top of said side wall portions and circumscribing the peak and valley areas thereof, and both of said lip top portions and exterior wall portion being of a substantial and substantially uniform width and height respectively around said side wall for engagement with a mating structure on said top member, and said side wall peak and valley areas comprising defining means for further cooperative resisting crushing of the package from the top and bottom, for cooperating with the peak areas of the base member to guide the comestible into the comestible receptacle of said base member, for providing oppositely disposed top and bottom access means for withdrawl of a portion of the comestible, and for cooperation with said peak areas of said side wall of said base portion to hold the bulk of the comestible therein upon opening and removal of a portion of the comestible; and

an integrally formed lip re-enforcement flange projecting exteriorly of and substantially normal to said upwardly projecting lip, said lip reenforcement flange projecting from the bottom of said lip exterior wall throughout substantially the entirety of the circumference thereof, said lip re-enforcement flange projecting from said uniform height exterior wall of said lip to correspond generally to said peak and valley areas;

said integrally formed top member including a substantially centrally disposed comestible cover for covering said comestible and having a transverse cross-sectional shape which is substantially congruent with the transverse cross-sectional shape of the comestible for a substantially snug fit of the comestible therein, said comestible cover having a substantially planar portion for confining the top of the comestible and having cover side wall portions connected to and extending downwardly from said planar portion, and oppositely disposed pair of said cover side wall portions being of greater length than the side wall portions disposed normal thereto to form oppositely disposed top member side wall peak areas and oppositely disposed top member side wall peak areas and oppositely disposed top member side wall valley areas with said cover side wall portions decreasing in length from the top member side wall peak areas to the top member side wall valley areas, said top member side wall peak areas and top member side wall valley areas are respectively of a size, shape and circumferential disposition to correspond to those of said base member peak areas and base member valley areas;

a lip engagement rim having a rim top portion normally disposed and projecting outwardly from the bottom surface of said top member side wall and having an exterior rim wall extending downwardly from said rim top portion cover to have a size, shape and circumferential disposition for matingly engaging said lip of said base member; and

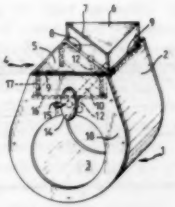
an integrally formed lip engagement rim re-enforcement flange projecting exteriorly of and substantially normal to the bottom of said exterior rim wall of said lip engagement rim and having size, shape and disposition for mating engagement with said lip re-enforcement flange of said base member.

4,427,130

PILL DISPENSER INCORPORATED IN FINGER RING

Elemer Szigeti, 1 Place Eugene M., 06000 Nice Alpes Maritimes, France

Filed Sep. 22, 1981, Ser. No. 304,477
Claims priority, application France, Oct. 2, 1980, 80 21140
Int. Cl.³ B65D *83/04*
U.S. Cl. 221—4 **6 Claims**



1. Individual distributor for granulated products and particularly medicaments in a form administrable by the oral route, such as tablets, pills or lozenges, to be carried directly on the body as a finger ring as well as a wrist bracelet, said distributor comprising an annular portion having an inner surface and an

outer surface, on the outer surface of which is arranged at least one compartment having an upper face and a bottom and movable in the radial direction of the annular portion between an upper open position and a lower closed position, associated with an opening device disposed under said bottom of said compartment, said opening device being fast with a means for warning the user of said distributor in the open position, including a part directed towards said inner surface of said annular portion in the open upper position of said compartment while the same is left through said opening device.

4,427,131

CAPSULE ORIENTING DEVICE, PARTICULARLY FOR CAPSULE-FILLING OR PROCESSING MACHINES

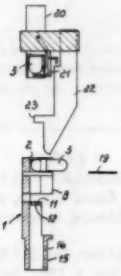
Libero Facchini, Bologna, Italy, assignor to Farmatic S.r.l., Ozzano Emilia, Italy

Filed Nov. 6, 1979, Ser. No. 91,847

Claims priority, application Italy, Nov. 9, 1978, 29650 A/78

Int. Cl.³ B65G *47/24*; B65H *9/10*

U.S. Cl. 221—173 **2 Claims**



1. A capsule orienting device, particularly for capsule-filling machines for filling capsules composed of a cap and a bottom, said device including a bush element defining a calibrated passage therein for the capsules to be loaded with product, a longitudinal slit communicating with said passage, an upper cross slot and a lower cross slot arranged to intersect said passage and said slit, the bush element being designed, in use, to sequentially engage with a first abutting member designed to enter the lower slot to stop the descent of a capsule fed into the passage and with a second abutting member designed to enter the upper slot and to engage the capsule stopped by the said first abutting member, thereby causing the capsule to rotate upwards or downwards depending on the arrangement of the capsule in the passage and to be disposed horizontally with its cap in said passage and its bottom projecting from and frictionally held in said longitudinal slit, a pusher being further provided having an extention movable along said passage and a portion movable along said longitudinal slit and adapted to orient the horizontally arranged capsules in alignment with said passage, wherein according to the improvement said device further comprises a neck in said passage underneath said lower slot on which the capsules rest after being oriented by said pusher portion and through which the capsules are forced by said pusher extension.

4,427,132

LIQUID STORAGE AND MEASUREMENT SYSTEM

John A. Thomson, Hampshire, England, assignor to Avery-Hardoll Limited, England

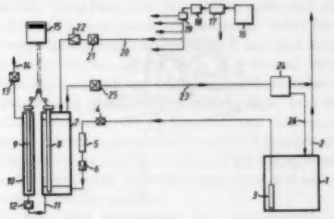
Filed Sep. 15, 1981, Ser. No. 302,651

Claims priority, application United Kingdom, Sep. 18, 1980, 8030153

Int. Cl.³ B67D *5/16*

U.S. Cl. 222—23 **16 Claims**

1. A liquid storage and measurement system including a bulk liquid storage means, at least one liquid measurement vessel of known dimensions capable of receiving a relatively much smaller volume of liquid than that stored in the bulk storage means and arranged to be partially filled with liquid to provide a liquid/gas interface, means for supplying liquid from the bulk storage means to the measurement vessel, means for discharging liquid from the measurement vessel, transducer means for, during discharge of the liquid from the measurement vessel, continually sensing and monitoring the level of the interface during each of a plurality of predetermined time intervals such as to produce an electrical signal indicative of the position of the interface during each predetermined time interval, signal



generating means arranged to produce an electrical signal indicative of a reference interface level during each said time interval, measuring means responsive to the reference and interface signals to provide an indication of the change in position of the interface during successive time intervals and control means for applying data derived from said signals to an algorithm related to the known dimensions of the measurement vessel and the rate of change of level at any point in the measurement vessel to provide a volumetric indication of the liquid being continuously discharged at any instant from the measurement vessel.

4,427,133

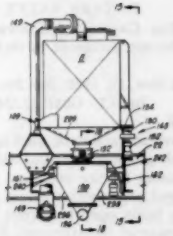
ADDITIVE MATERIAL METERING SYSTEM WITH WEIGHING MEANS

Gerald C. Kierbow, and Herbert J. Horinek, both of Duncan, Okla., assignors to Halliburton Company, Duncan, Okla.

Division of Ser. No. 114,628, Jan. 23, 1980, abandoned. This application May 12, 1981, Ser. No. 263,016

Int. Cl.³ G01G *7/00*

U.S. Cl. 222—77 **14 Claims**



9. A portable material handling system, comprising:

a transportable frame having ground engaging means for allowing said frame to transverse a ground surface; and

container means, supported from said transportable frame by a first support means and a load cell support means for sensing a weight supported by said load cell support means and for generating a signal representing said weight, for containing a material, said load cell support means including a lift means movable between a first position wherein said load cell support means is held in

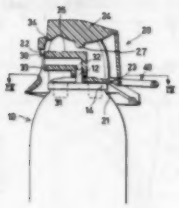
load supporting engagement with said container means and a second position wherein said load cell support means is held out of load supporting engagement with said container means.

4,427,134

AEROSOL DISPENSER CONTAINER AND ACTUATOR THEREFOR

Albert A. Almouli, 24 Lipski St., Tel Aviv, Israel

Filed Jul. 1, 1981, Ser. No. 279,351
Int. Cl.³ B67B 5/00
U.S. Cl. 222—153 **9 Claims**



1. An aerosol dispenser container comprising:

a nozzle which is depressable to open a normally-closed valve and to produce a discharge of the container contents therethrough;

a cap overlying the nozzle and including an actuator element to depress the nozzle to produce said discharge;

and a blocking tab receivable between said cap actuator element and the nozzle for permitting the depression of the nozzle by the actuator element only upon removal of the blocking tab;

said blocking tab being formed at one end with a bifurcation straddling the nozzle for blocking the depression thereof by the actuator element, and being formed at the opposite end with a finger-gripping element for pulling out the blocking tab to permit depression of the nozzle by the actuator element, said blocking tab being further formed at an intermediate portion with a pair of projections extending laterally on opposite sides thereof and enageable with the inner face of the cap for securely holding the tab in place until forcefully removed.

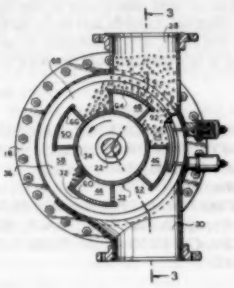
4,427,135

ROTARY VALVE

Patrick W. MacKay, Garcia, and Gilberto G. Garcia, Monterrey, both of Mexico, assignors to Hylsa, S.A., Monterrey, Mexico

Filed Nov. 17, 1980, Ser. No. 207,388
Int. Cl.³ G01F 11/24
U.S. Cl. 222—368 **9 Claims**

1. A rotary valve adapted to be used in regulating the gravity flow of a friable granular material, said valve comprising in combination a casing having inlet and outlet conduits connected to the upper and lower portions thereof respectively, said inlet conduit being open to permit vertical flow of said friable granular material therethrough, and a generally cylindrical inner wall, a generally cylindrical rotor within said casing mounted for rotation about a horizontal axis therein and substantially spaced from the inner wall of said casing to provide an annular space of sufficient width between said rotor and casing that particles of said friable material can pass without crumbling in said space from the inlet conduit to the outlet conduit, said rotor having a ring of alternately open and closed pockets therein constructed and arranged to receive granular material fed to said inlet conduit and transmit it to said outlet conduit, said closed pockets supporting at least some of the weight of said friable granular material when said rotor is rotated to bring such pockets under the inlet conduit, and baffle means mounted in the annular space between said rotor and casing at the up-turning side of the rotor to prevent flow of granular material through said annular space counter-current to the direction of motion of said rotor, said baffle means



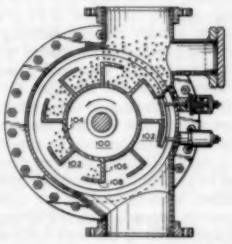
having an inner surface close to and curved to conform with the periphery of said rotor, said surface extending circumferentially a distance greater than the circumferential extent of one of said open pockets.

4,427,136

ROTARY VALVE

Patrick W. MacKay, Garza Garcia, and Gilberto G. Garcia, Monterrey, both of Mexico, assignors to Hylsa, S.A., Monterrey, Mexico

Continuation-in-part of Ser. No. 207,388, Nov. 17, 1980. This application Aug. 4, 1981, Ser. No. 289,997
Int. Cl.³ G01F 11/24
U.S. Cl. 222—368 **8 Claims**



1. A rotary valve adapted to be used in regulating the gravity flow of a friable granular material, said valve comprising, in combination, a casing having inlet and outlet conduits connected to the upper and lower portions thereof respectively and a generally cylindrical inner wall, a generally cylindrical rotor disposed within said casing mounted for rotation about a horizontal axis therein and substantially spaced from the inner wall of said casing to provide an annular space of sufficient width between said rotor and casing that particles of said friable material can pass without crumbling in said space from the inlet conduit to the outlet conduit, said rotor having a ring of at least partially open pockets defined by spaced radial walls having arcuate lips extending from the walls in a direction opposite to the direction of rotation of the rotor to render the pockets partially closed, said pockets being arranged to receive granular material fed to said inlet conduit and transmit it to said outlet conduit, and baffle means mounted in the annular space between said rotor and casing at the up-turning side of the rotor to prevent flow of granular material through said annular space counter-current to the direction of motion of said rotor,

said baffle means having an inner surface close to and curved to conform with said arcuate lips, and said inner surface extending circumferentially a distance greater than the circumferential extent of the open portion of any of said partially open pockets.

4,427,137

METERING VALVE FOR DISPENSING PRESSURIZED LIQUIDS

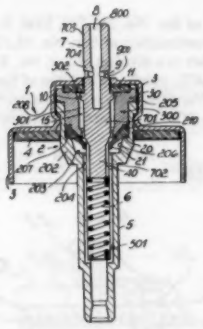
Uberto Dubini, Lecco, Italy, assignor to S.p.A. Valvole Aerosol Research Italiana -V.A.R.I., Olginate, Italy

Filed Sep. 21, 1981, Ser. No. 304,430

Claims priority, application Italy, Nov. 19, 1980, 26098 A/80

Int. Cl.³ B65D *83/00*

U.S. Cl. 222—402.2 **2 Claims**



1. A metering valve device for dispensing pressurized fluids, comprising a bowl element having an elongated tubular portion with a hollow duct interior and an enlarged inverted bell-like portion having a bottom with an opening therein and an open top opposite to said bottom, said enlarged inverted bell-like portion having an enlarged cavity therein in communication with said hollow duct interior of said tubular portion extending from the bottom of said inverted bell-like portion and coaxial therewith, seat formations in said enlarged cavity, a sleeve-like structure received in said seat formations

within said enlarged cavity and coaxial therewith, said sleeve-like structure having an open ended hollow inside and a substantially cylindrical portion

with a first open end and an opposite funnel-like open end portion facing said hollow duct interior

in selective communication with said hollow inside,

an axially slidable sleeve stem extending through said open ended hollow inside and coaxial therewith, said valve stem having a main portion and an at least partially reduced diameter end portion extending beyond said hollow inside, through said funnel-like portion and into said hollow duct interior, said main portion having a diameter less than the diameter of said hollow inside thereby to leave an annular space therebetween, said funnel-like portion

having an end aperture annular lip with a diameter less than the diameter of said main portion, said main portion having an end extension extending beyond said hollow inside, through said first open end of said open ended hollow inside, and into the outside of said container, said reduced diameter end portion of said valve stem having a diameter not greater than the inner diameter of said hollow duct interior, duct means in said main portion of said valve stem

having at least one first end aperture opening into the outside at said end extension of said main portion of said stem and at least one second aperture opening at a circumferential periphery of said main portion of said valve stem, sealing means at said first open end of said hollow inside between said sleeve structure and said main portion of said valve stem, stop means for defining the stroke of axial displacement of said valve stem from an extended position in which said annular space is sealed off with respect to the outside to a retracted position in which said second aperture opens into said annular space to provide communication between said annular space and the outside through said duct means and said first aperture thereof, said annular space between said sealing means and said funnel-like portion defining the metering volume for the pressurized fluid to be dispensed, supporting means for said bowl element for connection with a pressurized fluid container, wherein according to the improvement said sleeve-like structure comprises said funnel-like open end portion in the form of a first independent annular valve lip member for cooperating with said valve stem and said substantially cylindrical portion in the form of a second independent substantially cylindrical interchangeable member having a preestablished thickness and inner shape, said first independent annular valve lip member and said second independent interchangeable substantially cylindrical member having mutually mating surfaces with engagement formations for removable mutual engagement and said enlarged inverted bell-like portion

having first seat formations for permanently receiving therein said first independent annular valve lip member and having second seat formations for removably receiving therein said second independent interchangeable substantially cylindrical member thereby to render said metering volume defined by said annular space dependent on the selected thickness and shape of said second independent interchangeable substantially cylindrical member.

4,427,138

POURER FOR BOTTLE-LIKE CONTAINERS

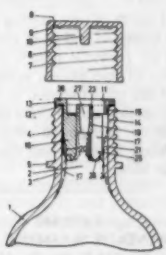
Hans Heinlein, Dombühlstrasse 33, D-8801 Schillingsfürst, Fed. Rep. of Germany

Filed Sep. 21, 1981, Ser. No. 304,040

Claims priority, application Fed. Rep. of Germany, Sep. 25, 1980, 3036139

Int. Cl.³ B65D *47/40*

U.S. Cl. 222—546 **18 Claims**



1. A plastic pourer insertable into a mouth of a bottle-like container having a rim portion sealable with a cap, said pourer including in an upper portion thereof a first hollow-cylindrical wall part which extends only a portion of the axial height of said pourer, a sealing flange extending from the normally upper end of said hollow-cylindrical wall part and adapted to at least partially cover the rim of said mouth, said first hollow cylindrical wall part having a radially outer wall surface which is adapted to bear against the inner wall of said mouth, an inner hollow cylindrical part carried by said first hollow-cylindrical wall part and of smaller diameter than said first hollow-cylindrical wall part, at least two radially and axially extending elastic holding struts carried by said inner hollow cylindrical part, said holding struts being in circumferentially spaced relation to each other and extending for at least a portion of

their axial length along the radially outer surface of said inner hollow-cylindrical part, said holding struts being adapted to bear elastically against the inner wall of the container mouth with a holding pressure which is greater than a holding force exerted between said pourer and a holder means for applying said pourer to the mouth of the container

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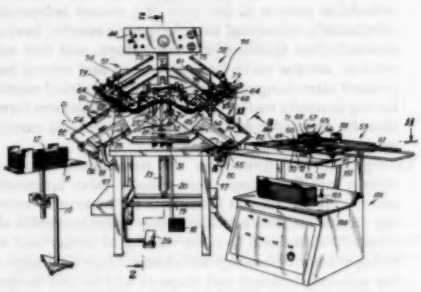
4,427,139

COLLAR PRESSING METHOD AND APPARATUS

Lloyd Depriest, Marshall, Ark., assignor to Capital-Mercury Shirt Corp., New York, N.Y.

Filed Aug. 31, 1981, Ser. No. 297,832
Int. Cl.³ A41H *43/00*
U.S. Cl. 223—2 **6 Claims**



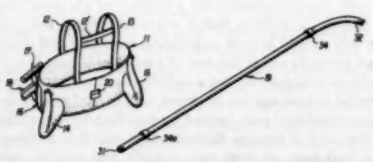
1. The method of forming a pressed collar blank for the attachment to a shirt or the like from a collar preform which includes congruent first and second fabric plies and a stiffener ply, said fabric plies being superposed over said stiffener ply and being sewn together along a margin-adjacent stitch line connecting three edges defining the free edge and the transverse edges of the collar, which comprises the steps of inverting one of said fabric plies over the other of said plies to encompass said stiffener ply between said pair of fabric plies, whereby said stitch line is encompassed by said free and transverse edges, subjecting said inverted plies to heat and pressure, thereby to flatten said plies, and thereafter, and while said plies remain heated as a result of said heating step, applying a gripper to said plies to transport said plies, transporting said plies to the surface of an air pervious platen, while supporting said plies on the surface of said platen, applying suction through said platen against the plies thereon, to bias said plies against said platen by said suction and to draw the heat therefrom and retaining said plies on said platen subjected to such suction until said collar blank is set in said flattened condition, and stacking said collar blank.

4,427,140

WINDOW WASHING KIT

Charles H. Dennis, Jr., 616 E. 8th St., Muncie, Ind. 47302

Filed Nov. 21, 1980, Ser. No. 209,067
Int. Cl.³ A45C *1/04*; B65D *35/28*
U.S. Cl. 224—148 **8 Claims**



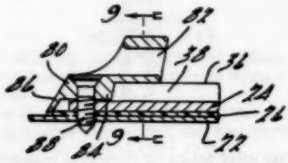
1. A window washing kit comprising:
a tubular belt to be worn about the body of the user and having a hollow interior for containing water to be used for washing windows;
at least one tube joined at one end to the belt and being in fluid communication with the hollow interior of the belt for receiving water therefrom, the other end of the tube being open;
a scrubber or water applicator having one end thereof received in the open end of the tube and supported thereby; and
an elongate pole for supporting the scrubber at either end of the pole when the scrubber is being used to wash windows.

4,427,141

ARTICLE CARRIER FOR AUTOMOTIVE VEHICLES

John A. Bott, 931 Lake Shore Dr., Grosse Pointe Shores, Mich. 48236

Continuation of Ser. No. 242,138, Mar. 9, 1981, abandoned, which is a continuation of Ser. No. 56,373, Jul. 10, 1979, abandoned, which is a division of Ser. No. 924,072, Jul. 7, 1978, Pat. No. 4,182,471, which is a division of Ser. No. 743,602, Nov. 22, 1976, Pat. No. 4,099,658, which is a continuation of Ser. No. 486,415, Jul. 8, 1974, abandoned. This application Nov. 19, 1982, Ser. No. 443,024
Int. Cl.³ B60R *9/00*
U.S. Cl. 224—326 **4 Claims**



1. An article carrier for an automobile comprising
a plurality of at least two parallel arranged slats disposed on a generally horizontally extending exterior body surface of the automobile and lying closely against said surface;
each of said slats having major and minor transverse dimensions, with said major dimension being arranged substantially parallel to said body surface and said minor dimension being arranged substantially perpendicular to said body surface, each of said slats having a generally horizontally arranged upper article supporting surface adapted to have articles supported directly thereupon, and
a pair of end members disposed one at each end of at least one of said slats,
at least one of said end members comprising means for securing articles to said article carrier and including means for securing said slat and said end member to said exterior body surface.

4,427,142

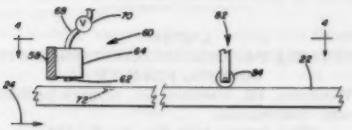
METHOD OF AND APPARATUS FOR GRIT BLAST DAMAGE FREE SCORE INITIATION

Charles J. Hyatt, Cheswick, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Aug. 3, 1981, Ser. No. 289,028
Int. Cl.³ C03B *33/02*
U.S. Cl. 225—2 **13 Claims**

10. A method of initiating a damage-free score in a piece of refractory material, comprising the steps of:
projecting particles of a grit material toward the surface of said refractory piece to impose a selected zone of surface damage thereon;
contacting the zone of surface damage with a scoring means;
moving said scoring means and said refractory piece relative to one another to advance said selected zone of surface damage to initiate a damage-free score; and

continuing to move said scoring means and said refractory piece relative to one another in a movement path to advance said selected zone of surface damage beyond said



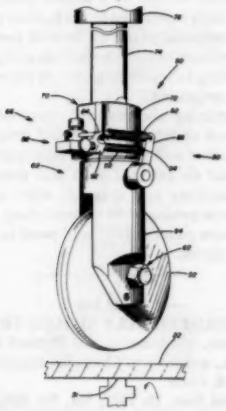
scoring means to continue to propagate said damage-free score through said refractory piece along the relative movement path.

4,427,143

APPARATUS FOR AND METHOD OF INITIATING A DAMAGE-FREE SCORE

Charles J. Hyatt, Cheswick, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Oct. 2, 1981, Ser. No. 308,001
Int. Cl.³ C03B *33/02*; B26D *3/08*
U.S. Cl. 225—2 **9 Claims**



1. A method of initiating a damage-free score in a refractory piece along a selected path, comprising the steps of:

biasing a pivotable and rotatable scoring wheel into contact with the surface of said refractory piece with a biasing force, said scoring wheel oriented in an initiating position such that the plane in which said scoring wheel is rotatable forms an oblique angle with said selected path of scoring; and

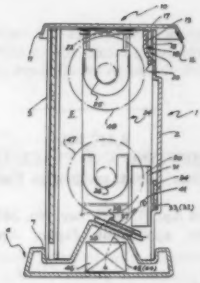
moving said scoring wheel and said refractory piece relative to one another along said selected path, such that the interaction between said scoring wheel and said refractory piece generates an aligning force to pivot said scoring wheel from said initiating position through said oblique angle toward a scoring position where said plane of rotation is aligned with said selected path, said oblique angle and said biasing force having selected values sufficient to produce a zone of surface damage on said refractory piece as said scoring wheel pivots from said initiating position toward said scoring position, to initiate a damage-free score in said refractory piece.

4,427,144

PLASTICS FILM DISPENSER

Wallace J. Macgrory, and George C. Frederick, both of Manly, Australia, assignors to EZY Wrap Products Pty. Limited, Manly, Australia

PCT No. PCT/AU80/00049, § 371 Date May 5, 1981, § 102(e) Date Apr. 29, 1981, PCT Pub. No. WO81/00704, PCT Pub. Date Mar. 19, 1981
PCT Filed Aug. 25, 1980, Ser. No. 261,179
Claims priority, application Australia, Sep. 5, 1980, PE0355
Int. Cl.³ B65H *35/04, 35/06*
U.S. Cl. 225—7 **4 Claims**



1. A plastics film dispenser, said dispenser including a support structure comprising a housing (**1**) having a front wall (**2**), back wall (**3**), end walls (**4,5**) and a bottom (**6**), said front wall (**2**) terminating above said bottom and providing an outlet (**27**) from said housing, a socket (**25,26**) on each end wall, a roll of plastics film (**47**) supported in said sockets (**25,26**), guide means (**36,37**) in said housing to guide film from said roll (**47**) to said outlet (**27**), said guide means comprising a fixed flap (**36**) and a movable flap (**37**) pivotally mounted in said housing, said flaps having a substantial width and provided with a length extending continuously transversely across said outlet (**27**), said movable flap (**37**) normally overlying said fixed flap (**36**) with said film therebetween, film severing means (**41**) located adjacent said outlet, brackets (**28,29**) at each end of said outlet, a drop plate (**34**) extending across said outlet (**22**) and mounted in said brackets (**28,29**), said drop plate (**34**) movable from a normal position wherein film being withdrawn from said dispenser is maintained clear of said film severing means (**41**) to an active position where said severing means is exposed to said film for contact by said severing means to sever a length of film from said roll (**47**), said flaps (**36,37**) spaced inwardly from said outlet (**27**), inwardly from said film severing means (**41**) and inwardly from said guide means (**36,37**), said film severing means (**41**) comprising an electrically heated wire fixed in said housing across said outlet (**27**) and connected to an external source of power through a low-voltage transformer.

4,427,145

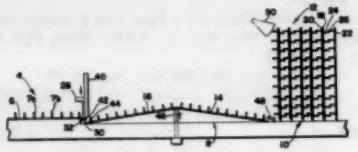
PACKING OF NAIL PLATES

Roderick E. Harris, Miami, Fla., assignor to Gang-Nail Systems, Inc., Miami, Fla.

Filed Jan. 6, 1982, Ser. No. 337,455
Int. Cl.³ B65G *57/28*
U.S. Cl. 225—97 **20 Claims**

11. Apparatus for pairing plates with teeth struck out from such plates protruding therefrom and arranging such plates into a stack with groups of teeth of any adjacent plates directed towards one another being intermeshed, said apparatus comprising: supply means for supplying a longitudinally extending stream of plates to said stacking means with adjacent longitudinally extending plates being interconnected; means for separating two plates at a time from an extending stream of plates supplied to said apparatus; stacking means for folding such pair

of plates into a back-to-back relationship with their teeth pointing in opposite directions, said stacking means includes means for separating the two plates of a pair of plates and folding



means for folding such two plates in a back-to-back relationship; and stack receiving means for forming a stack of such folded plates with the teeth of adjacent plates being intermeshed.

4,427,146

BUTTON ORIENTING AND PLACING APPARATUS

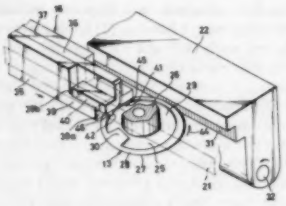
Fumio Seki, Toyama, Japan, assignor to Yoshida Kogyo K. K., Tokyo, Japan

Filed Apr. 9, 1982, Ser. No. 366,844

Claims priority, application Japan, Apr. 22, 1981, 56-58450[U]

Int. Cl.³ A41H *37/10*

U.S. Cl. 227—119 **3 Claims**



1. An apparatus for orienting and placing a button for attachment to a garment, the button including a disk-shaped head, a shank projecting centrally from the reverse side of the head, and a tab disposed on the reverse side of the head and extending radially thereof, said apparatus comprising:

(a) a guide having a side wall and a friction member disposed oppositely to said side wall to define therewith a guide channel for guiding therethrough the button;

(b) a pusher mechanism for pushing the button through and out of said guide channel, said pusher mechanism including

(1) a button pushing slide slidably supported on said guide and having a stepped end portion engageable at its tip end with the head of the button on its peripheral edge,

(2) a locking lever pivotally mounted on said pushing slide and having a flanged end portion extending beyond said stepped end portion of said pushing slide and terminating in a pair of downwardly directed claws for catching therebetween the tab of the button,

(3) means urging said locking lever to cause said flanged end portion to engage said stepped end portion of said pushing slide, and

(4) said pushing slide being movable between a first position in which both said pushing slide and said locking lever are retracted out of said guide channel for allowing the button to be introduced into said guide channel, and a second position in which both said pushing slide and said locking lever project through said guide channel for pushing the button out of said guide channel; and

(c) said side wall having an inwardly directed flange engageable with the shank of the button in said guide channel, said friction member having a frictional surface frictionally engageable with the head of the button on the peripheral edge thereof for causing the button to roll, when the latter is pushed by said pushing lever in said guide channel, until the tab of the button is catched by said claws.

4,427,147

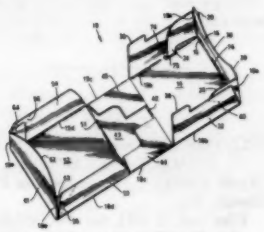
ERECTABLE PAPERBOARD CONTAINER WITH LOCKING FEATURE

Henry Wischusen, III, Norcross, Ga., assignor to Rock Tenn Company, Norcross, Ga.

Filed Jul. 12, 1982, Ser. No. 397,661

Int. Cl.³ B65D *5/22*

U.S. Cl. 229—33 **6 Claims**



1. In a collapsible container of paperboard or the like including a Beers corner formed by a bottom panel, front and side wall panels foldably connected to the bottom panel, and a glue flap foldably connected to one of the wall panels and adhered to the interior surface of the other of the wall panels, said glue flap defining a drag tab extending toward the bottom panel, the improvement comprising:

means for retaining said drag tab comprising a slit in said bottom panel under the path of said drag tab and spaced from said other wall panel, said slit trapping said drag tab between said slit and said other wall panel; and

means for receiving said drag tab when said container is collapsed comprising a slit defined along the intersection of said bottom panel and the wall panel to which said glue flap is connected.

4,427,148

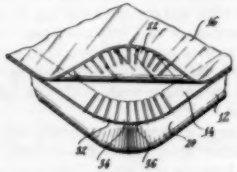
HERMETICALLY SEALED TRAY

George M. Seiter, Minneapolis, and Richard Gould, St. Paul, both of Minn., assignors to Champion International Corporation, Stamford, Conn.

Filed Mar. 18, 1982, Ser. No. 359,563

Int. Cl.³ B65D *5/64*

U.S. Cl. 229—43 **6 Claims**



1. A plastic coated paperboard tray comprising:

a bottom wall,

a side wall joined with said bottom wall and extending upwardly therefrom,

a flange presenting a bonding surface extending along the upper edge of said tray side wall, said flange extending outwardly away from said side wall and around the periphery of said tray, said flange including a plurality of

corner portions along the periphery of said tray, said corner portions of said tray including

a plurality of depressions and ridges therein extending radially outward at said corners transverse to the length of said flange, and

a heat-sealable material disposed along said flange at the corners thereof filling said depressions and overlying said ridges so that it assumes the shape of said ridges and depressions, and

a cover sheet for enclosing the top of said tray secured hermetically to the bonding surface of said flange and heat-sealable material, said heat-sealable material is integrally formed on said cover sheet in a complementary pattern to said depressions on said flange prior to applying said cover sheet to said tray.

4,427,149

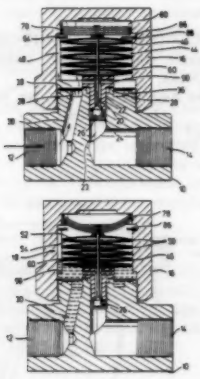
BI-METALLIC STEAM TRAP

Rai R. Adachi, Scarborough, Canada, assignor to Erwel Inc., Toronto, Canada

Filed Nov. 13, 1981, Ser. No. 321,283

Int. Cl.³ F16T *1/08*

U.S. Cl. 236—59 **12 Claims**



1. A steam trap comprising, in combination, a housing having a fluid inlet port, a fluid outlet port, and valve means within said housing between the inlet port and the outlet port comprising a valve having a valve stem adapted to seat on a valve seat for controlling fluid flow through said steam trap from said inlet port to said outlet port, a bimetallic assembly responsive to temperature variations for controlling the opening and closing of said valve means, said bimetallic assembly comprising at least one primary bimetallic member mounted within said housing operably connected to said valve stem to open and close the valve on the valve seat, and at least one secondary bimetallic member adapted to be supported within the housing in opposition to closing of the valve on the valve seat by said primary bimetallic member, said secondary bimetallic member arranged such that said primary bimetallic member expands during initial heating thereof without interference from the secondary bimetallic member but continued expansion of said primary bimetallic member and closing of the valve on the valve seat are opposed by said secondary bimetallic member whereby closing of the valve on the valve seat by the primary bimetallic member is resisted as the temperature of the fluid increases.

4,427,150

MOTOR VEHICLE WITH A COMBUSTION ENGINE

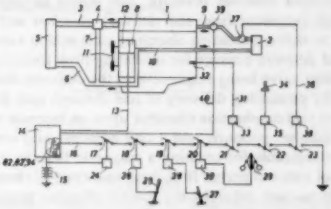
Richard van Basshuysen, Heilbronn-Biberach; Dietrich Schmidt, Bönnigheim, and Max Ruf, Obereisesheim, all of Fed. Rep. of Germany, assignors to Audi NSU Auto Union Aktiengesellschaft, Fed. Rep. of Germany

Filed Nov. 25, 1981, Ser. No. 324,934

Claims priority, application Fed. Rep. of Germany, Nov. 26, 1980, 3044422

Int. Cl.³ G05D *23/00*; F02N *17/02*

U.S. Cl. 237—2 A **12 Claims**



1. A motor vehicle provided with a combustion engine, an alternator, a battery and a heating installation for the passenger cabin having a heating unit which comprises a heating circuit and a heating exchanger fed by the heating liquid for the heating of air;

the alternator being liquid cooled and having a rotor and chambers adapted to receive cooling liquid and being switchable into the heating circuit, the alternator having field coils; and

means to short circuit the field coils switching the alternator into an eddy current brake.

4,427,151

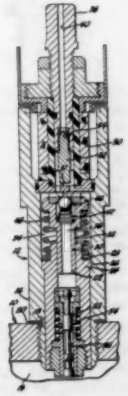
FUEL INJECTOR

Myron U. Trenne, Rochester, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Feb. 28, 1979, Ser. No. 15,947

Int. Cl.³ F02M *49/02*

U.S. Cl. 239—87 **6 Claims**



1. An injector for delivering fuel directly to an engine combustion chamber, said injector including a housing, a piston in said housing, a sleeve closing one end of said housing and surrounding one end of said piston and thereby defining a control chamber between said sleeve and said housing and a

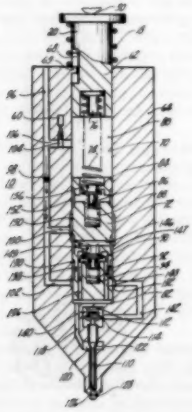
delivery chamber between said sleeve and said piston, said sleeve having an end adapted for exposure to the pressure in said combustion chamber and being adapted to slide relative to said piston and said housing and thereby increase the pressures in said control and delivery chambers upon an increase in pressure in said combustion chamber, said housing having a supply passage connected to said control and delivery chambers for supplying fuel thereto, a magnetically responsive control valve disposed in said supply passage, said valve being responsive to the difference between the control chamber pressure and the supply passage pressure for obstructing flow from said control chamber to said passage upon an increase in the control chamber pressure, said sleeve having a delivery passage extending from said delivery chamber and adapted to open to said combustion chamber, an injection valve disposed in said delivery passage for inhibiting flow therethrough, said injection valve being responsive to the delivery chamber pressure for permitting delivery of fuel through said delivery passage to said combustion chamber upon an increase in the delivery chamber pressure, and a coil adjacent said control valve and energizable for creating a magnetic field to displace said control valve to permit flow from said control chamber to said supply passage, whereby the control chamber pressure may be reduced and the combustion chamber pressure may cause said sleeve to slide and thereby deliver fuel from said delivery chamber through said delivery passage to said combustion chamber while said coil is energized, and wherein said control valve is responsive to the difference between the supply passage pressure and the control chamber pressure for permitting flow from said supply passage to said control and delivery chambers upon a decrease in the control chamber pressure, whereby said control valve may be displaced to fill said control and delivery chambers with fuel without energizing said coil.

4,427,152

PRESSURE TIME CONTROLLED UNIT INJECTOR

Albert E. Sisson, Farmington, and Donald J. Lewis, Troy, both of Mich., assignors to The Bendix Corporation, Southfield, Mich.

Filed Jul. 13, 1981, Ser. No. 282,629
Int. Cl.³ F02M 47/00
U.S. Cl. 239—90 **11 Claims**



1. A fuel injector for an internal combustion engine comprising:

a body having an axially extending bore;

a primary pumping piston and a secondary piston positioned within said body for axial movement therein;

a nozzle situated at the end of said bore remote from said primary pumping piston;

a timing chamber defined in said body between said primary pumping piston and said secondary piston;

a metering chamber defined in said body between said secondary piston and said nozzle;

passages in said body of said injector for receiving pressurized fuel and transmitting said fuel into said timing chamber and said metering chamber characterized in that said fuel injector further comprises:

means for controlling (1) the timing of the discharge of fuel from the metering chamber through the nozzle and (2) the quantity of fuel stored in said metering chamber subsequent to said discharge of fuel in accordance with a pressure-time function including an electronically operated control valve for controlling the flow of fuel among said passages, said timing chamber, and said metering chamber; and

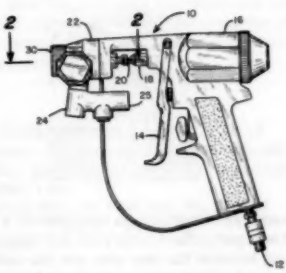
said controlling means further including a restrictive orifice in at least one of said passages leading to said metering chamber for restricting the flow into said metering chamber and for reducing in cooperation with said secondary piston, the pressure in said metering chamber to the vapor pressure of the fuel during the time that fuel is permitted to flow to said metering chamber.

4,427,153

PLURAL COMPONENT DISPENSING DEVICE

Thomas J. Schaefer, Buffalo, Minn., assignor to Graco Inc., Minneapolis, Minn.

Filed Aug. 16, 1982, Ser. No. 408,425
Int. Cl.³ B05B 7/04
U.S. Cl. 239—117 **38 Claims**



1. A liquid spray nozzle for receiving at least two liquid components for mixing and dispensing, comprising

(a) a nozzle housing having inlets for separately receiving said liquid components, and having an internal passage therethrough along an axis, and having passages respectively coupling each of said inlets to axially spaced openings into said internal passage;

(b) a mixing chamber member axially positioned in said nozzle housing internal passage, said member having axially spaced raised flanges sealably isolating respective axially spaced openings to create axially positioned circumferential passages, said mixing chamber member having an axial bore therethrough and having internal passages communicating between said axial bore and respective ones of said axially positioned circumferential passages; and

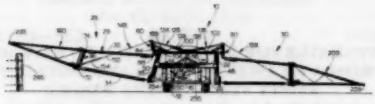
(c) a retractable plunger sealably fitted in said mixing chamber member axial bore.

4,427,154

BOOM SUSPENSION AND LIFT ASSEMBLY

LeRoy J. Mercil, Box 55, Brooks, Minn. 56715

Filed May 17, 1982, Ser. No. 378,897
Int. Cl.³ B05B 3/02, 3/12
U.S. Cl. 239—161 25 Claims



1. A boom assembly mountable on a vehicle which comprises:

a main frame;

means to mount the main frame on a vehicle;

a separate boom extending laterally from each side of the main frame, each boom including a generally upright base post and a generally upright link and having laterally extending upper and lower members pivotally connected on separate vertically spaced longitudinal axes to the generally upright link at their outer ends and pivotally connected on separate vertically spaced longitudinal axes with respect to the generally upright base at their inner ends, and the base post being pivotally mounted with respect to the main frame on a generally longitudinal base post pivot axis intermediate of the longitudinal axes adjacent the inner ends of the upper and lower members;

means coupled to the main frame for suspending each boom in operative position extending laterally from the main frame and permitting the upper and lower members of each boom to pivot relative to the main frame; and

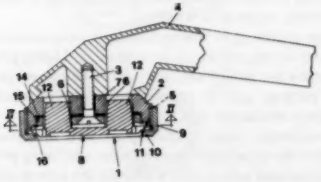
means between the main frame and each boom for independently raising each boom relative to the main frame by pivoting the base post of the respective boom about its base post pivot axis and pivoting the associated boom about at least one of the longitudinal axes adjacent the inner ends of the upper and lower members of the boom.

4,427,155

ADJUSTABLE SHOWER HEAD

Nils Larsson, Dalavägen 50, Västra Frölunda, Sweden 400 72

Filed Aug. 26, 1981, Ser. No. 296,487
Claims priority, application Sweden, Aug. 26, 1980, 8005954
Int. Cl.³ B05B 1/32
U.S. Cl. 239—460 9 Claims



1. In a shower head comprising a hollow housing for the passage of water, an adjustable sprinkler device mounted on the water outflow end of said housing, and adjusting means cooperating with said sprinkler for adjusting the through-flow area of the shower head, the improvement comprising:

a housing having a plurality of openings, each of which openings has an increase in its cross-sectional area in the direction of water outflow;

an insert member axially displaceably mounted downstream of said housing having a plurality of plunger elements corresponding to the housing openings, each of which plunger elements is displaceably inserted within a housing opening and each of which has an increasing cross-sectional area in the direction of water outflow;

channel-shaped grooves forming passages for water outflow between the housing and the insert, in the outer surface of the insert plunger elements and/or the inner surface of the insert openings, said grooves extending in the direction of water outflow;

flow adjustment means comprising a nut member rotatably mounted at the outflow end of said housing for axially displacing said insert member; and

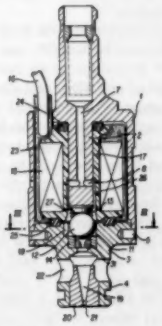
sealing means for forming a seal between the housing and the insert to prevent the passage of water through other than said channel-shaped grooves.

4,427,156

ELECTROMAGNETICALLY ACTUATED BALL-TYPE INJECTOR

Pierre Bouthors, Croissy sur Seine, and Jacques Lecomte, Montesson, both of France, assignors to Regie Nationale des Usines Renault, Boulogne-Billancourt, France

Filed Oct. 28, 1981, Ser. No. 315,906
Claims priority, application France, Oct. 29, 1980, 80 23105
Int. Cl.³ B05B 1/34
U.S. Cl. 239—488 8 Claims



1. An electromagnetically actuated injector for the injection of fluid in internal combustion engines, comprising:

a casing;

a core centrally located in said casing;

an actuating coil surrounding said core;

a cover enclosing a portion of said casing;

a first chamber defined between said core and said cover;

fluid inlet means for providing fluid to said first chamber;

an injection passage formed in said cover and extending into said first chamber;

a seat at the junction of said injection passage and said first chamber;

a ball in said first chamber and movable between a first position in which said ball cooperates with said seat to close said injection passage and a second position;

a solid disc of hard magnetic material positioned in said first chamber between said ball and said core, said disc having a flange and a surface facing said ball, said surface being coated with a thin layer of nonmagnetic material; and

spring means extending between said ball and said flange for elastically biasing said ball into said first position and for elastically biasing said solid disc in contact with said core.

4,427,157

PREPARATION OF STYRENE-POLYMER AND POLYOLEFIN MICRO-BITS

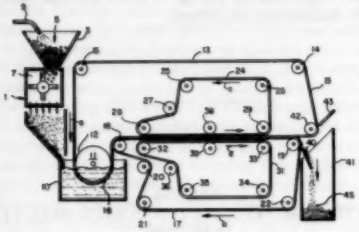
Max Klein, 257 Riveredge Rd., Tinton Falls, N.J. 07724

Division of Ser. No. 833,644, Sep. 15, 1977, Pat. No. 4,207,378, Continuation-in-part of Ser. No. 342,535, Mar. 16, 1973, abandoned. This application May 19, 1980, Ser. No. 150,737

The portion of the term of this patent subsequent to Dec. 8, 1998, has been disclaimed.

Int. Cl.³ B02C *11/08, 21/00, 23/18;* **B30B** *9/24*

U.S. Cl. 241—15 **14 Claims**



1. A method for preparing micro-bits of an expanded thermoplastic polymer selected from the group consisting of,

(i) a styrene-polymer,

(ii) a polyolefin which is the polymer of an ethylenically unsaturated hydrocarbon having 2 to 6 atoms carbon,

(iii) a melt alloy of polyethylene with about ten percent by weight of polystyrene,

(iv) a copolymer of propylene with from about 20 to about 30 percent of ethylene by weight, and

(v) a melt alloy of propylene in an amount exceeding 50 percent by weight of said alloy and a copolymer of ethylene and vinyl acetate to the extent of up to about 30 percent, each said polymer being non-brittle in expanded form, said micro-bits being from about 40 to about 325 microns long and from about 20 to about 325 microns wide, substantially free of intact cells of the starting expanded polymer from which said micro-bits are produced, and substantially without any uniformity in outline of the individual micro-bit particles, which method comprises:

(a) feeding expanded bit-pieces of said expanded, thermoplastic polymer and water into a confined comminuting zone provided with a feed inlet, a discharge, and a plurality of spaced-apart impact surfaces rotatably mounted in said comminuting zone between said feed inlet and said discharge, said discharge comprising a dispersed plurality of orifices, said orifices ranging from substantially circular, having diameters from about 0.102 to about 3.175 millimeters to substantially rectangular, having widths from about 0.254 to about 3.175 millimeters and lengths from about 3.81 to about 12.7 millimeters, said orifices being arranged in arcuate screening array and spaced radially apart from said impact surfaces to an extent sufficient to avoid collision between said orifices and said impact surfaces; and

(b) impelling said expanded, thermoplastic polymer bit pieces in said water through a circular path in said comminuting zone by repeated impact on them with said impact surfaces rotating at from about 4700 to about 8000 revolutions per minute, and at the same time driving said expanded, thermoplastic polymer bit pieces against the edges of said orifices with said impact surfaces, thereby comminuting said bit-pieces of said expanded, thermoplastic polymer by repeated tearing, ripping and shearing micro-bits from said bit-pieces; said water being so proportioned to said expanded, thermoplastic polymer bit-pieces in said feed to maintain the temperature in the comminuting zone below that at which degradation of said expanded thermoplastic polymer bit-pieces would occur.

4,427,158

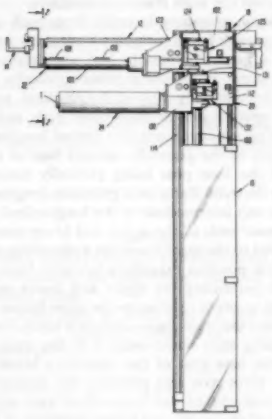
APPARATUS FOR REMOVING FILLED PACKAGES FROM A FILAMENT WINDER AND INSTALLING EMPTY TUBES ON THE WINDER

Peter Conrad, Charlotte, N.C., assignor to Fiber Industries, Inc., Charlotte, N.C.

Filed Jun. 11, 1982, Ser. No. 387,645

Int. Cl.³ B65H *67/04, 54/26*

U.S. Cl. 242—35.5 A **22 Claims**



1. Apparatus in combination with a row of winders each of which winds filamentary material upon a tube supported for rotation about a rotary axis of the winder to form a package, said apparatus servicing each winder by removing a package from the winder and replacing the package with a tube and comprising:

a carrier suspended from above the row of winders for movement generally parallel to the row of winders,

means for positioning said carrier selectively at locations for servicing respective winders,

package exchange means including an arm mounted on said carrier for up-and-down movement and being positionable opposite the rotary axis of a winder being serviced so that the package can be transferred from the winder to the package exchange arm,

tube exchange means including an arm mounted on said carrier for up-and-down movement and being positionable opposite said axis so that a tube on the tube exchange arm can be transferred to the winder,

shuttle means spaced above the row of winders, and including a package transfer arm and a tube transfer arm,

means vertically moving said package exchange means and said tube exchange means to the general level of said shuttle means,

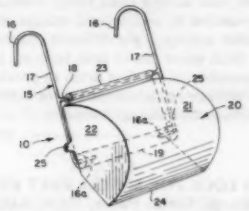
means for effecting transfer of the package from the package exchange arm to the package transfer arm and for effecting transfer of a tube from said tube transfer arm to said tube exchange arm, and

means for propelling said shuttle means to a remote station where the package is removed from said package transfer arm and a tube is installed on said tube transfer arm.

4,427,159
HOLDER FOR SPARE TOILET TISSUE

George W. Miller, c/o George Spector, 3615 Woolworth Bldg., 233 Broadway, and George Spector, c/o George W. Miller, 3615 Woolworth Bldg., 233 Broadway, both of, New York, N.Y. 10007

Filed Aug. 10, 1981, Ser. No. 291,304
Int. Cl.³ B65H *19/04*
U.S. Cl. 242—55.3 1 Claim

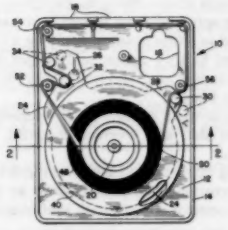


1. A holder for a spare roll of toilet tissue, comprising in combination a wire frame having hooks for hooking around a spindle of a conventional tissue roll that is in use, mounted in a recess of a wall, and a generally semi-cylindrical cover mounted pivotally on said frame for covering said spare roll and means for pivotally lifting said cover on said frame wherein said means include a cross rod on said frame, a rolled over edge on said cover being hinged on said cross rod, said frame further including parallel straight rods having said hooks at the inner end and turned in stubs at the outer end spaced from said cross rod to receive thereon a spindle for said spare roll, said straight rods extending from said hooks to said stubs at an angle to and spaced from the said wall, said cover further including tabs that abut said rods to provide clearance for the tissue.

4,427,160
EQUALIZER FOR TAPE TENSION

Richard D. Myers, Worcester, Mass., assignor to Marathon Products Corporation, Worcester, Mass.

Filed Jun. 18, 1982, Ser. No. 389,599
Int. Cl.³ G11B *23/10*
U.S. Cl. 242—55.19 A 12 Claims



1. In a tape or film reel cartridge of the endless self-rewinding type having a spindle wherein the tape or film feeds out from the interior of a reel and feeds back to the reel at the outer periphery thereof,

the improvement comprising spring-free means engaging the feedout area of the tape or film and springless means engaging the feedback area of the tape or film,

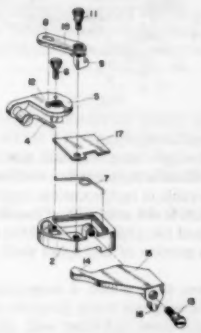
a support for both said means, said support comprising a disc on the spindle and being movable according to the tension of the tape or film at the areas engaging the means,

wherein the support and both said means are fixed relative to each other, and the tape is the sole element moving said support and both means.

4,427,161
BAIL ARM TURNING DEVICE FOR FISHING SPINNING REEL

Akinori Sakumoto, Higashikurume, Japan, assignor to Daiwa Seiko Inc., Tokyo, Japan

Filed May 10, 1982, Ser. No. 376,736
Claims priority, application Japan, May 29, 1981, 56-78559[U]
Int. Cl.³ A01K *89/01*
U.S. Cl. 242—84.2 A 2 Claims



1. In a fishing spinning reel mountable on a fishing rod having a rotor, bail arm attaching members secured in a protruding manner relative to, and forwardly of, said rotor on both sides thereof, an arm lever disposed at one end of a bail arm and rotatably supported at the end of a first of said bail arm attaching members, the other end of said bail arm being supported by a second of said bail arm attaching members, means for resiliently biasing said arm lever between a winding position and a releasing position, said biasing means comprising a dead point spring mounted in said first bail arm attaching member, and a manipulation lever including means for rotatably supporting said manipulation lever on said first bail arm attaching member so that said lever can be pulled in a direction toward said fishing rod, said manipulation lever and said arm lever being connected operatively to each other so that said bail arm can move from the winding position to the releasing position by the pulling of said manipulation lever, the improvement comprising:

a crank including means for rotatably securing said crank to substantially the mid-point of one side of said first bail arm attaching member, said crank being disposed between said arm lever and said manipulation lever, said crank being provided at one end portion with an elongated hole and at an opposite end portion with a projection; a pin projecting from one surface of said arm lever in said direction and fitting into said elongated hole; said manipulation lever supporting means being disposed rearwardly of said crank securing means on said first bail arm attaching member, and extending at right angles thereto; said manipulation lever including an actuating tab formed at one end thereof adjacent said supporting means and said projection of said crank, said actuating tab being rotatably movable about said supporting means into engagement with said crank projection to cause said crank to rotate said arm lever, thereby turning said bail arm, when said manipulation lever is pulled in said direction.

4,427,162
FISHING REEL

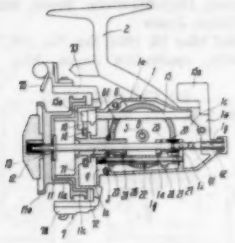
Hideo Noda, Sakai, Japan, assignor to Shimano Industrial Company Limited, Osaka, Japan

Filed Jan. 27, 1982, Ser. No. 343,169

Claims priority, application Japan, Jan. 31, 1981, 56-13132[U]; Jan. 31, 1981, 56-13133[U]

Int. Cl.³ A01K *89/01*

U.S. Cl. 242—84.21 R **6 Claims**



1. A fishing reel comprising:

a reel body having a front wall and side walls;

a spool shaft which is supported to said reel body in relation of being movable in reciprocation longitudinal of said reel body, projects at the axially front end forwardly from said front wall, and has a spool at said front end and a traverse groove at a portion of said spool shaft entering into said reel body;

a tubular driven shaft which is supported rotatably to the front wall of said reel body, projects at the axially front end forwardly from said front wall, and has at said front end a rotary frame having a ball arm and at a portion of said driven shaft entering into said reel body a pinion;

a drive shaft having a master gear engageable with said pinion; and,

a rotary member having an engaging member engageable with said traverse groove at said spool shaft and being supported rotatably with respect to said spool shaft;

said reel body being provided with an association shaft disposed in parallel to said entering portion of said spool shaft, a first drive coupling means provided between said association shaft and said driven shaft, and a second drive coupling means provided between said association shaft and said rotary member, so that said rotary member rotates in association with said driven shaft and at different speed with respect thereto.

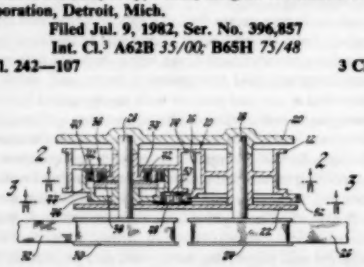
4,427,163
DUAL-SPOOL RETRACTOR FOR SEAT BELTS

Joseph D. Kosdziola, Troy, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Jul. 9, 1982, Ser. No. 396,857

Int. Cl.³ A62B *35/00*; B65H *75/48*

U.S. Cl. 242—107 **3 Claims**



1. A seat belt retractor assembly for a dual belt system comprising; a first rotatable shaft and belt storage member; a second rotatable shaft and belt storage member; a first drum rotatably supported on said first shaft; a second drum drivingly connected with the second rotatable shaft; a spring member operatively connected between said first and second drums and cooperating therewith to provide a spring motor; and an epicyclic gear mechanism including a sun gear rotatable with said first drum, a ring gear rotatably supported on said first shaft and drivingly connected with said second drum, a gear carrier secured for rotation with said first shaft and a plurality of pinion gears rotatably supported on said gear carrier and meshing with said sun gear and ring gear, said first shaft being rotated by extension of the belt connected with said first storage member, said second shaft being rotated by extension of the belt connected to said second storage member, said first drum member undergoing a different number of revolutions than either shaft when one or both belts are extended to wrap the spring member on the first drum to provide a spring force which will enforce retraction of one or both of the extended belts on its respective storage member.

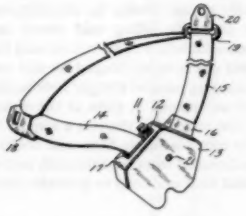
4,427,164
CINCH LOCK FOR SAFETY BELT RETRACTORS

Robert J. Rumpf, Grosse Pointe, Mich., assignor to The Firestone Tire & Rubber Company, Akron, Ohio

Filed Jun. 21, 1982, Ser. No. 390,250

Int. Cl.³ B65H *75/48*

U.S. Cl. 242—107.4 R **4 Claims**



1. A manual lock structure for safety belt retractors in which a frame having a generally channel shaped journal means in support of at least one webbing spool and the webbing spool has ratchet flanges, a retractor motor drivably connected to said spool, and including a pawl lockably engageable against said ratchet flanges and held out-of-contact therewith by a feeler element selectively engageable against the webbing of said spool, and a condition sensing element operably connected to said pawl and urging said pawl toward engagement with said ratchet flanges upon sensing an emergency comprising:

an overcenter spring secured to said frame and to said pawl element and in a first position applying a bias against said pawl toward locking against said ratchet flanges and in a second position biasing said pawl away from contact with said ratchet flanges;

a manually activated plunger-lever operable in only one direction to shift said overcenter spring to a said first position; and

a return spring connected to said frame and to said plunger-lever and returning said plunger-lever to its normal position out-of-control contact with said overcenter spring.

4,427,165
SEWING MACHINE THREAD GUIDE WITH PROTECTIVE GUARD

Robert H. Larsen, Middletown, and Harold R. Piszczek, Randolph, both of N.J., assignors to The Singer Company, Stamford, Conn.

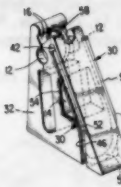
Filed May 4, 1983, Ser. No. 491,153

Int. Cl.³ B65H *57/04*; B63B *21/34*

U.S. Cl. 242—157 **9 Claims**

1. A plastic guide for sewing thread extending from a supply spool on a sewing machine, the guide including an opening for

the thread to pass therethrough, and the guide being disposed on the machine to alter the direction of the thread path; and a metal wear bar affixed to the guide in a position to engage



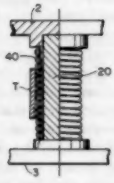
thread exiting from said opening and prevent the thread from cutting a groove in the plastic material of the guide at the exit end of the opening.

4,427,166

MAGNETIC TAPE CASSETTE

Kengo Oishi; Masayoshi Moriwaki, and Choji Komiyama, all of Odawara, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Jan. 12, 1981, Ser. No. 224,238
Claims priority, application Japan, Feb. 6, 1980, 55-13885[U]
Int. Cl.³ G03B *1/04;* G11B *15/32;* B65H *23/04*
U.S. Cl. 242—199 **9 Claims**



3. A magnetic tape cassette comprising first and second cassette casing halves; a pair of hubs rotatably disposed in a hollow space between said cassette casing halves; magnetic tape wound on said hubs and transferable from either of said hubs for recording and playback to said other hubs; and tape guide means disposed in a tape running path between said hubs and contacting said magnetic tape, said tape guide means comprises a cylindrical rod-shaped member having said grooves formed integrally therewith in a circumferential surface thereof, said grooves formed integrally with said rod-shaped member and inclined above a center portion of said tape guide means at a predetermined acute angle with respect to said direction of travel of said tape and inclined at the negative of said predetermined acute angle below said center portion, and a groove is provided in said center portion of said tape guide means extending parallel to said direction of travel of said tape.

4,427,167

STABILIZING APPARATUS FOR AN AIR LAUNCHED WEAPON

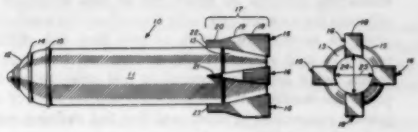
Peter Daniels, Fredericksburg, Va., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Sep. 21, 1981, Ser. No. 303,801
Int. Cl.³ F42B *15/16*
U.S. Cl. 244—3.24 **4 Claims**

1. Apparatus for stabilizing an air launched weapon in free flight after being dropped by an airplane which weapon includes a nose and a tail, comprising:

ring means concentrically disposed about the weapon nose defining spoiler means for reducing nose lift by separating air flow thereover; and

means increasing tail stability while minimizing tail lift of the weapon comprising a plurality of radially extending free-standing wedge shaped fins, each fin having sides defining



a wedge angle tapering to a wedge apex and the wedge angles opening rearward of the weapon and each wedge apex facing forward;

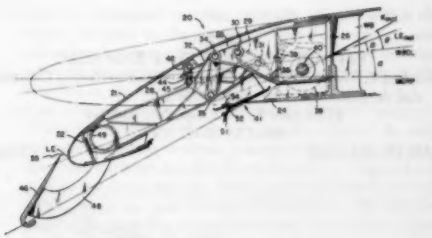
said fins further including first and second stepped portions defining outer faces connected by an angled ramp for moving the fin center of pressure rearward.

4,427,168

VARIABLE CAMBER LEADING EDGE MECHANISM WITH KRUEGER FLAP

Maurice E. McKinney, Bellevue, and Peter K. C. Rudolph, Seattle, both of Wash., assignors to The Boeing Company, Seattle, Wash.

Filed Sep. 29, 1981, Ser. No. 306,747
Int. Cl.³ B64C *3/50*
U.S. Cl. 244—214 **18 Claims**



1. A variable camber airfoil of the type having a leading edge and a trailing edge and defining a wing chord reference plane passing through the leading and trailing edges, comprising, in combination:

(a) a rigid, centrally located, span-wise structural wing box including means defining a leading structural main frame;

(b) a leading structural span-wise edge member spaced forwardly from said wing box main frame;

(c) a continuous upper flexible skin secured to said leading structural edge member and said structural wing box;

(d) lower skin surface defining means secured to said leading structural edge member and said structural wing box with said upper skin and said lower skin surface defining means defining an airfoil envelope;

(e) a structural rib rigidly secured to said leading structural main frame and projecting forwardly towards said leading structural edge member;

(f) a rigid beam-like drive fitting secured to said leading structural edge member and projecting rearwardly towards said leading structural main frame, said drive fitting having its chord-wise centerline generally coincident with said wing chord reference plane when said leading structural edge member is in its normal undeflected state;

(g) first generally upright link defining means pivotally connected at its upper end to said structural rib intermediate said leading structural main frame and the forward

extremity of said structural rib, said first link defining means being pivotally connected to said drive fitting adjacent the rearmost extremity thereof and defining a drive crank;

(h) second generally upright link defining means pivotally connected adjacent its upper end to said structural rib adjacent the forward extremity thereof and forward of the point of pivotal connection of said first link defining means to said structural rib, said second link defining means being pivotally secured to said drive fitting at a point intermediate its opposite ends and forward of said pivotal connection between said first link defining means and said drive fitting; and,

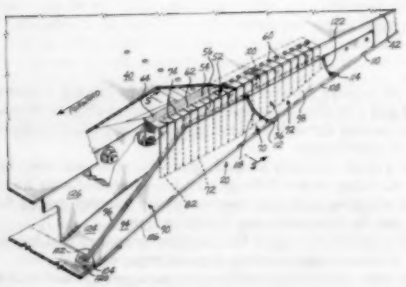
(i) actuating means coupled to said drive crank for pivoting said first link defining means about its point of pivotal connection to said structural rib between a first forward position where said leading structural edge member is in the non-deflected position coincident with said wing chord reference plane and a second rearward position where said leading structural edge member is in a deflected position with respect to said wing chord reference plane, and wherein said structural rib, said drive fitting and said first and second generally upright link defining means are all confined entirely within said airfoil envelope at all operative positions of said variable camber airfoil leading edge.

4,427,169

VARIABLE CAMBER FLAP END SEAL

Stephen T. Brown, Bellevue, Wash., assignor to Boeing Commercial Airplane Company, Seattle, Wash.

Filed Jun. 8, 1982, Ser. No. 386,251
Int. Cl.³ B64C 3/44
U.S. Cl. 244—219 **16 Claims**



1. In a variable camber flap, an end seal comprising:

closely spaced sealing members extending generally vertically downwardly from adjacent and being associated with the top of the flap, said sealing members being between the forward and after ends of the flap; and

lower sealing means extending generally vertically upwardly from adjacent and being associated with a bottom of the flap;

said closely spaced sealing members being slidably and sealingly engaged with said lower sealing means;

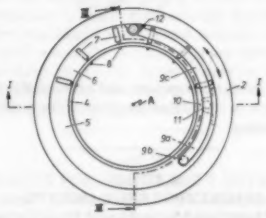
said lower sealing means being adapted to remain in sealing engagement with said closely spaced sealing members as the camber of said flap is varied by increasing the curvature as it is lowered from a normally upper position.

4,427,170

CABLE HOLDER HAVING RELATIVELY ROTATABLE PARTS

Thomas Truninger, Zurich, Switzerland, assignor to Adna Aktiengesellschaft, Vaduz, Liechtenstein

Filed May 11, 1982, Ser. No. 377,189
Claims priority, application Switzerland, May 13, 1981, 3109/81
Int. Cl.³ F16L 3/00
U.S. Cl. 248—51 **4 Claims**



1. A holder for a flexible power supply cable, comprising a pair of sleeves disposed end-to-end and having a common central axis, at least one of said sleeves being rotatable about said axis relative to the other, first and second means fixedly mounting the cable respectively on the inner walls of said sleeves, a guide ring mounted on said other sleeve and extending into said one sleeve, said guide ring defining a uniform annular space with said inner wall of said one sleeve, first cable support means on said guide ring extending transversely into said annular space over at least a part of the circumference of the ring at one side of said first cable mounting means on said other sleeve, and second cable support means on said guide ring being axially spaced from said first cable support means and extending transversely into said annular space over at least a part of the circumference of the ring at the other side of said first cable mounting means on said other sleeve; the cable forming a loop between said first and second mounting means in said annular space, said loop having a lower cable portion, an upper cable portion running parallel to said lower cable portion and an arc portion between said lower portion and said upper portion, said lower cable portion being supported on said first cable support means and a variable length of said upper cable portion being supported on said second support means whenever said second cable mounting means of said rotatable sleeve during rotation of said sleeve is at said other side of said first mounting means, the length of said lower portion and of said upper portion of the cable being increasing and decreasing respectively and vice-versa during rotation of said one sleeve with the sum of the lengths of said lower and upper portions respectively being constant and equal to the required range of rotation.

4,427,171

MOUNTING BRACKET FOR USE IN INSTALLING BEAM-LIKE CHANNEL MEMBERS UNDER HORIZONTAL SURFACES, IN PARTICULAR CEILINGS

Jørgen O. Frederiksen, Gasvaerksvej 16, 6580 Vandrup, Denmark

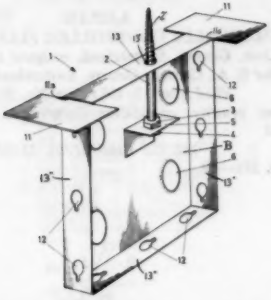
Filed Dec. 15, 1981, Ser. No. 330,907
Claims priority, application Denmark, Dec. 16, 1980, 5345/80
Int. Cl.³ F16L 3/22
U.S. Cl. 248—68 R **6 Claims**

1. A mounting bracket for use in installing a beam-like channel member under and to a horizontal surface, particularly a ceiling, said channel member being provided with fastening means which have free ends extending from said channel member for use in fastening the latter to said mounting bracket, said mounting bracket comprising:

a shallow open box having a substantially rectangular base and

four sidepieces connected thereto and extending perpendicularly from the same side thereof; and

at least one anchor member attached to said mounting bracket and designed to be screwed into said horizontal surface, one of said sidepieces having at least one opening for respectively receiving an anchor member therethrough, and the other three sidepieces being respectively provided with a plurality of openings for receiving said free ends of said fastening means of said channel member to effect fastening thereof to said mounting bracket.



4,427,172

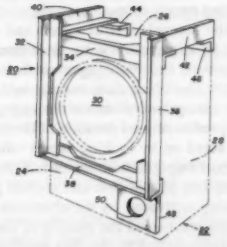
FRAME FOR TAMPER PROOFING A METER HOUSING

Clinton V. Cooper, 311 Sands Pl., Pensacola, Fla. 32505

Filed Oct. 19, 1981, Ser. No. 312,637

Int. Cl.³ G01C *1/04*; F16M *13/02*

U.S. Cl. 248—551 **4 Claims**



1. A tamper-resistant rigid frame attachment for mounting on an electrical meter housing, said housing comprising a front wall containing an opening for a meter face, a rear wall, and lateral walls connecting said front and rear walls and enclosing said meter, said lateral walls comprising top, bottom, and side walls, said frame comprising:

a. front frame means enframing said opening;

b. second frame means extending rearwardly along one of said lateral walls from said front frame means to rear means for engaging said rear wall; and

c. means for securing said front frame means to said front wall at a point spaced from said side walls.

4,427,173

SELF-LEVELING SLEEVE INSERT FOR CONCRETE PASSAGES

Robert K. MacKay, 44 Irving Dr., South Walpole, Mass. 02071

Filed Feb. 22, 1982, Ser. No. 350,985

Int. Cl.³ E04G *15/00*

U.S. Cl. 249—39 **7 Claims**

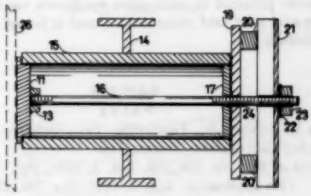
1. A pipe sleeve device for forming a passage through a concrete structure used in conjunction with a vertical form wall, which device is rigidly self-aligned and totally secured by attaching the device to a single vertical form wall and the device comprises:

a first form wall provided with an interior surface which contacts the concrete, an exterior surface and a hole through the wall connecting the two surfaces;

a rigid hollow sleeve around which concrete may be poured and which thereby forms a passage in the concrete, which sleeve is provided with an opening at each end forming a clear passage through the hollow sleeve, and which sleeve is located interiorly of the form wall;

a first solid end cap covering one sleeve opening and removably secured thereto;

a second end cap covering the other sleeve opening, which second end cap is provided with a small central opening therethrough and which second end cap fits tightly and removably within the sleeve opening, wherein the second end cap opening is aligned with the wall hole to assure alignment of the device;



a rigid rod elongated member centrally located within the sleeve, secured to the interior of the first end cap, and extending out through the opening in the second end cap, wherein the extended end of the rod passes through the opening in the form wall;

a rigid cross-member secured to the end of the rod exteriorly of the form wall spanning a substantial portion of the wall;

a rod fastener means to create a compressive force between the cross-member and the sleeve to pull the first end cap against the sleeve and the sleeve against the first form wall to sandwich the wall securely therebetween, so that the device is sufficiently secured to the first form wall to resist the weight of the concrete;

a second vertical form wall which merely abuts the first end cap and which second form wall is secured to the first form wall by means independent of the device for receiving poured concrete between the form walls.

4,427,174

IRRIGATION SYSTEM FLUSHING VALVE

Raphael Mehoudar, Tel-Aviv, Israel, assignor to Hydro-Plan Engineering Ltd., Tel Aviv, Israel

Filed Jul. 23, 1981, Ser. No. 286,355

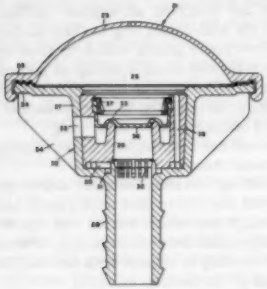
Claims priority, application Israel, Aug. 6, 1980, 60774

Int. Cl.³ G05D *7/01*

U.S. Cl. 251—16 **9 Claims**

1. An irrigation system flushing valve comprising a housing, a coupling inlet of said housing for coupling to an end of an irrigation line, a flushing valve outlet of said housing, a valve seating formed in said housing communicating with said inlet and with said outlet, valve obturating means juxtaposed with respect to said seating and displaceable with respect thereto from a sealing position wherein said inlet is closed with respect to said outlet to an open position wherein said inlet communicates with said outlet; an extensible membrane mounted in said housing and defining with said obturating means a valve enclosure located within said housing and sealed with respect to said outlet by said obturating means and flow restricting means effecting flow communication between said inlet and said valve enclosure; the arrangement being such that the hydraulic

pressures in said valve enclosure and said inlet respectively act on opposite surfaces of said obturating means and when the



hydraulic pressure in said valve enclosure equals or exceeds that in said inlet said obturating means is biased into said sealing position.

4,427,175

VALVE

James B. Adams, Jr., Lewisville, Tex., assignor to Otis Engineering Corporation, Dallas, Tex.

Division of Ser. No. 156,200, Jun. 3, 1980, Pat. No. 4,378,931. This application Aug. 3, 1981, Ser. No. 289,817

Int. Cl.³ F16K *5/06*

U.S. Cl. 251—58 **2 Claims**

1. A valve comprising,

a housing,

means for reciprocating a valve actuator in said housing,

a sleeve having a bore removably secured in the housing,

said sleeve having longitudinal slot means and a stop shoulder,

a ball valve member in the bore through said sleeve,

first pivot pin means between said sleeve and said ball valve member providing for rotation of said valve member,

a tubular actuator reciprocal in said sleeve and having a valve seat cooperable with said ball valve member to control flow through said actuator,

control arm means carried by said actuator and reciprocal in said slot means,

second pivot pin means between said ball valve member and said control arm means rotating said ball valve member and causing said ball valve member to travel relative to said sleeve in an axial direction with reciprocation of said actuator,

the dimensional relationship between said sleeve stop shoulder and said ball valve member and said first and second pivot pin means positioning the bore through the ball valve member in exact alignment with the bore through the sleeve when the ball valve member and sleeve stop are engaged.

4,427,176

MANUALLY CONTROLLED FLUID VALVE

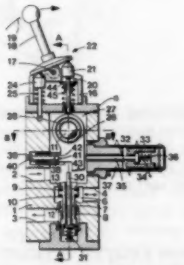
Jean Livet, Geneva, Switzerland, assignor to Sperry Vickers Lucifer S. A., Carouge-Geneve, Switzerland

Filed May 12, 1981, Ser. No. 262,913

Claims priority, application Switzerland, May 28, 1980, 4127/80

Int. Cl.³ F16K *31/02, 31/44*

U.S. Cl. 251—68 **4 Claims**

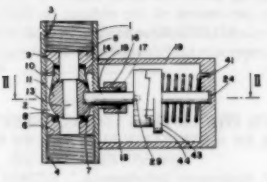


1. A manually controlled fluid valve comprising manual control means, obturating means located in a valve body and movable between first and second positions, means to provide a returning force on the obturating means when in the first position, connecting means to mechanically connect the obturating means to the manual control means and comprising at least one moving part operated on by electromagnetic means to control engagement and disengagement between the connecting means and the obturating means, said moving part cooperating with spring loaded means for engaging the obturating means in a predetermined position of the manual control means and being acted on by locking means which operate to keep the moving part engaged with the obturating means when in a predetermined one of said first and second positions, said locking means being activated by simultaneous excitation of the electromagnetic means and the placing of the moving part into a position corresponding to the first position of the obturating means, said moving part being axially movable and provided with means for articulation about a transverse axis for pivotal movement between first and second angular positions and arranged to engage said spring loaded means in the first angular position, said moving part being pivoted into the first angular position by operation of said electromagnetic means, said locking means comprising a first stop located in said valve body, and a second stop located on said moving part, said first stop being engaged by the second stop in said first angular position and being disengaged therefrom in said second angular position, which allows said manual control means to move freely and to displace said moving part without actuating said obturating means, said first stop comprising a pin, a sliding bush in which said pin is located, a spring acting on said bush, said second stop comprising a detent provided with a lip and located on said moving part, said spring acting to urge said sliding bush against said detent, wherein pivoting of the moving part into said first angular position in response to operation of said electromagnetic means causes the detent to push the sliding bush against the action of the spring, with axial movement of the moving part causing the detent to pass over the pin until the lip is checked by the pin.

4,427,177
SHOWER CONTROL

Spiridon Constantinescu, 2085 Islington Ave., Apt. 1408, and Serban Constantinescu, 2085 Islington Ave., Apt. 1702, both of Weston, Ontario, Canada M9P 3R1

Filed Apr. 27, 1981, Ser. No. 257,545
Int. Cl.³ F16K *5/06*
U.S. Cl. 251—230 **1 Claim**



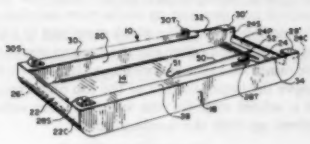
1. In a shower control valve including means to be placed in a run of a pipe connecting a mixing faucet to a shower head; a cylindrical housing having an axial flow opening therethrough, interior throughout threads, a lateral port, a short sleeve fixed to said lateral port; a ball type plug having a cylindical groove; axial means to support and to seal said ball type plug in its rotary motion inside said cylindrical housing; a valve stem having its inner end fixed into said cylindrical groove to rotate said ball type plug inside said cylindrical housing; and packing means for sealing said valve stem to said short sleeve; the improvement comprising, in combination, a rotatable device having

(a) two exterior opposite longitudinal clasping ridges on said cylindrical housing for attaching said rotatable device;
(b) a first hole made transversally in said valve stem for connecting said rotatable device;
(c) a casing attached to said cylindrical housing; said casing having
  (1) two opposite clips for attaching said casing to said cylindrical housing;
  (2) two opposite scissions for clasping said clips;
  (3) a bearing placed axially inside said casing opposite to said clips for supporting the outer end of said valve stem;
  (4) two stops inside said casing defining an angle slightly bigger than 90° with reference to the axis of said valve stem;
  (5) an opening into the underneath side of said casing for manipulating from outside said rotatable device; and
  (6) a first cylindrical groove placed inside said casing into the opposite side to said clips;
(d) a cylindrical pin entering in said first hole for rotating said valve stem;
(e) a driven ratchet disk axially mounted on said valve stem engaging said cylindrical pin in a rotatable movement; said driven ratchet disk having
  (1) a first circular central opening for receiving inside said valve stem;
  (2) a semicylindrical groove on the face close to said ball type plug, for engaging said cylindrical pin; and
  (3) a first set of four ratchets placed on the face away from said ball valve plug;
(f) a driving ratchet disk axially mounted on said valve stem for engaging said driven ratchet disk in a rotatable movement; said driving ratchet disk having
  (1) a second circular central opening for receiving inside said valve stem;
  (2) a second set of four ratchets placed on the face close to said ball type plug for cooperating with said first set of four ratchets in a rotary motion;
  (3) an eccentric for moving between said two stops and for converting a linear motion into a rotary motion;
  (4) a second hole into the end of said eccentric; and
  (5) a second cylindrical groove placed on the face away from said ball type plug;
(g) a torsion-compression spring axially mounted around said valve stem and having a first end fast in said first cylindrical groove and a second end fast in said second cylindrical groove, said torsion-compression spring compressing permanently said driving ratchet disk against said driven ratchet disk and turning permanently said driving ratchet disk against the downward linear motion of said eccentric; and
(h) a beaded chain hooked to said second hole and passing through said opening of said casing for pulling said eccentric to alternately close or open said ball type plug.

4,427,178
ACCESSORY FOR WHEELED FLOOR JACK

Stanley J. Kozlowski, 8443 S. Brandon Ave., Chicago, Ill. 60617

Continuation of Ser. No. 181,440, Aug. 25, 1980, abandoned. This application Aug. 4, 1982, Ser. No. 405,001
Int. Cl.³ B60P *1/48*
U.S. Cl. 254—1 **7 Claims**



1. An accessory for

a wheeled floor jack of the type that has a link-mounted saddle for contacting a weight to be lifted, a frame, and which saddle and frame move horizontally relative to one another as the saddle is driven from its vertically-retracted to its vertically-extended position, and wherein there are a plurality of wheels mounted to the frame to allow the jack to roll on a hard surface while being used,

comprising:

a guard, sized and shaped to encompass the wheels and to provide a flat, hard surface for the wheels to roll on, said guard defining a hard-surface operational path for the wheels which is long enough for the jack to move horizontally within the guard while the saddle is driven over substantially its range of positions from retracted to extended without being displaced from a vertical position, said guard including means for attaching it to the jack, and

wherein the guard includes as said attaching means, longitudinally extending and projecting top walls which serve to hold the wheels and thus the jack in the guard, and

wherein the top walls include cut-out sections which allow the wheels of the jack to be inserted from the top into the guard and removed from it, said cut-out sections being located such that the wheels admitted thereby are not adjacent the portion at either extent of their horizontal displacement in the guard so that the jack will not normally move out of the guard.

4,427,179
LEVELING APPARATUS

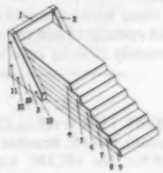
Franklin F. Price, 3426 Carnegie Dr., Olympia, Wash. 98503

Continuation-in-part of Ser. No. 285,530, Jul. 21, 1981, abandoned. This application Jun. 24, 1982, Ser. No. 391,487
Int. Cl.³ E02C *3/00*
U.S. Cl. 254—88 **3 Claims**

1. An apparatus for leveling a vehicle by elevating a wheel of the vehicle, comprising:

a leveling ramp comprising a base frame including a bottom

member, and a plurality of plank members of graduated lengths stackable on the bottom member, said plank members forming a gradual incline at one end of the ramp when stacked together and on the bottom member, with the height of the leveling ramp being adjustable by the removal or addition of one or more of the ramp planks, said base frame further including a pair of side members which are substantially shorter than the bottom member and which are connected to the bottom member at one end thereof, said side members projecting vertically upwardly, and a rear end member interconnected between said side members to form a three sided receptacle at the end of the bottom member in which rear end portions of the plank members are snugly received when they are stacked together and on the bottom member, said receptacle serving to hold the plank members in stacked position relative to each other and the bottom member at its end of the ramp, said rear end member always projects upwardly above the upper surface of the top plank member to serve as a wheel stop for the wheel of the vehicle which is driven up onto the leveling ramp.

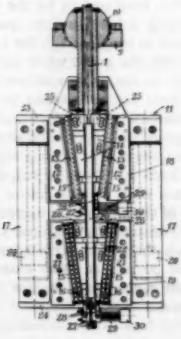


4,427,180

LINEAR HYDRAULIC WINCH COMPRISING A PAIR OF SELF-CLAMPING JAWS CLAMPING ALTERNATELY THE AXIAL CABLE

Robert Brieuc, Nanterre, France, assignor to Kley-France, France

Filed Jan. 13, 1982, Ser. No. 339,164
Claims priority, application France, Jan. 19, 1981, 81 00891
Int. Cl.³ B66F *1/00*
U.S. Cl. 254—106 **7 Claims**



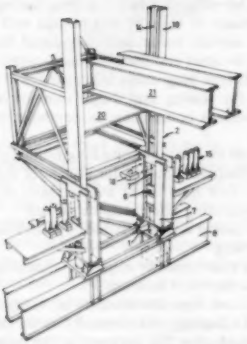
1. In a linear hydraulic winch comprising a frame, to which are fixed symmetrically two double-acting hydraulic jacks enclosing a pair of self-clamping jaws capable of locking in turn on to an axial cable at the end of which a load is fixed, said two self-clamping jaws being aligned along the axis of symmetry of the winch, one being interlocked in translation, along said axis of the winch, with the cylinders of these double-acting hydraulic jacks and the other with the pistons thereof, wherein said self-clamping jaws are cable clamping wedges comprising outer and inner elements having corresponding parallel oblique faces forming wedges and two groups of elongated cylinders wedgingly inserted between the corresponding oblique faces of the outer and inner elements, the cylinders of each group of said two groups of cylinders being connected together with the axial cable being located between said two groups of cylinders, said cylinders each being truncated through two parallel planes, symmetrically extending along the longitudinal axes of said each cylinder, the width of each of said truncated cylinders as measured between said parallel planes being about half of the diameter of said each cylinder, whereby movement of the oblique surface of said inner element towards the oblique surface of said outer element wedgingly compresses said cylinders between such oblique surfaces.

4,427,181

DEVICE FOR LIFTING LOADS, ESPECIALLY HEAVY LOADS, IN A STEPWISE MANNER BY MEANS OF ONE OR SEVERAL JACKS

Bengt V. Andersson, Jakobsgatan 7, S-72464 Västerås, Sweden, assignor to Bengt Valfrid Andersson, Västerås, Sweden

Continuation of Ser. No. 163,858, Jun. 27, 1980, abandoned. This application Jan. 29, 1982, Ser. No. 343,806
Claims priority, application Sweden, Jul. 5, 1979, 7905887
Int. Cl.³ B66F *1/08*
U.S. Cl. 254—108 **6 Claims**



1. A device for stepwise lifting of loads, especially heavy loads, by means of a jack, said device comprising

(a) a vertically upright, tubular support member which rests on a rigid bed and accomodates a lifting member displaceable within said support member by means of said jack between a lowered position and a raised position, the top end surface of said support member being situated below the top end surface of said lifting member in its raised position;

(b) a plurality of supporting elements the length of which is less than the length of displacement of said lifting member, said supporting elements being insertable into said support member between the top end surface of said lifting member in the lowered position thereof and the top end surface of said support member, whereby each inserted supporting element upon displacement of said lifting member to the raised position thereof is moved through said support member past the top end surface thereof so as to form a load carrying stack of supporting elements;

(c) a support plate insertable into engagement with said support member at the top end thereof above a supporting element accommodated therein, said support plate being formed in such a manner that when inserted it permits upward displacement of a supporting element when the same is partly situated within said support member, but prevents downward movement of said supporting element when the same has been raised above the top end surface of said support member; and

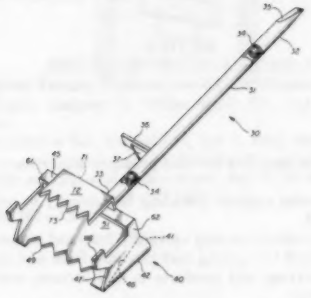
(d) a vertically upright guiding tube aligned with said support member at a distance above said support plate, when inserted, in order to enclose said stack of supporting elements to prevent horizontal movement thereof and of individual supporting elements inserted therein, the entire weight of the load being carried by said stack.

4,427,182

STAKE AND FORM REMOVAL DEVICE

Victor F. Marik, Houston, Tex., assignor to Form & Stake Lifts, Inc., Houston, Tex.

Filed Jun. 14, 1982, Ser. No. 388,454
Int. Cl.³ B66F *3/00*
U.S. Cl. 254—131 **4 Claims**



1. A tool for removal of form material from around a slab, said tool comprising:

A housing having a wall, an upper surface depending from said wall, and a stake passing aperture extending through said upper surface,

a lever member attached at one end to said housing;

said housing includes means for separating stake components from form components of said form material and further including means for removing said stake components from the subsurface, said separating means including a series of spaced teeth formed at one end of said wall of said housing, and said removing means including both an interior stake passageway through said housing communicating with said stake passing aperture through said upper surface of said housing and said series of spaced teeth.

4,427,183

GAS CONTROL SYSTEM FOR STEEL-MAKING CONVERTERS

Karl-Rudolf Hegemann, Am krausen Bäumchen 1, 4300 Essen-Bergerhausen, and Helmut Weissert, Zunftwiese 79, 4630 Bochum-Hiltrop, both of Fed. Rep. of Germany

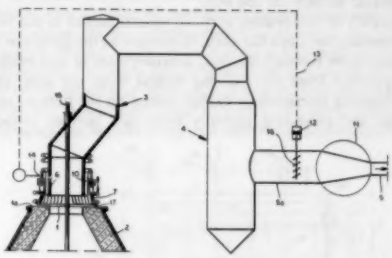
Filed Nov. 13, 1981, Ser. No. 321,071
Int. Cl.³ C21B *13/00*
U.S. Cl. 266—44 **4 Claims**

1. A method of operating a gas removal system for a steel-making converter wherein said system includes a converter having a mouth and adapted to receive a charge to be top blown in said converter, a hood forming a passage communicating with said mouth and provided with a closure ring movable toward and away from said mouth, a seal between said ring and said hood defining an annular chamber surrounding said hood and communicating with said passage to a blower connected with said hood for evacuating gases from said converter, said method comprising the steps of:

(a) measuring gas pressure in said chamber;

(b) converting the gas pressure measured in step (a) into an actual-value control signal representing the magnitude of the measured gas pressure; and

(c) regulating the rate at which gas is evacuated from said mouth by said blower in accordance with said signal to maintain said ring substantially equal to the rate of evolution of gas in said converter during at least part of the oxygen blowing of a charge therein.

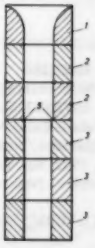


4,427,184

TAPHOLE APPARATUS

Rupert Steinwider, and Paul Weitzer, both of Vienna, Austria, assignors to Veitscher Magnesitwerke-Actien-Gesellschaft, Vienna, Austria

Filed Jan. 25, 1982, Ser. No. 345,273
Claims priority, application Austria, Feb. 5, 1981, 524/81
Int. Cl.³ C21C *5/46*
U.S. Cl. 266—45 **2 Claims**



1. A taphole apparatus for a steel-making converter, which is comprised of a series of refractory blocks each defining a bore and the bores being aligned to define respective and successive sections of the taphole, the bore of a first one of the refractory blocks at a hot inlet end of the taphole being funnel-shaped and the bore of a last one of the refractory blocks at a cold outlet end of the taphole having a smaller diameter than the funnel-shaped bore at the hot inlet end, the bores of the refractory blocks, except for the first block, being cylindrical and the diameters of the bores being gradually reduced in the direction of the cold outlet end.

4,427,185

METHOD AND APPARATUS FOR GASEOUS CLEANING OF ALUMINUM

Clifford J. Meyer, Terre Haute, Ind., assignor to Atlantic Richfield Company, Denver, Colo.

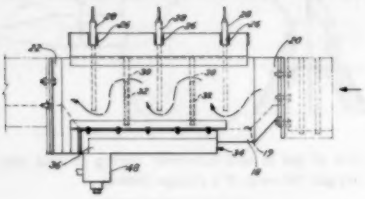
Filed Nov. 26, 1982, Ser. No. 444,537
Int. Cl.³ C22B *21/06*
U.S. Cl. 266—220 **5 Claims**

1. Improved apparatus for sparging molten metal comprising, in combination:

a sparging box having opposite sides partially defining a flow channel for molten metal, an end with a molten metal inlet at said end and an opposite end with a molten metal outlet at said opposite end, said box also including an open

top and a base assembly extending between the sides and ends to define the flow channel, said base assembly including a generally planar, horizontal surface defining an internal surface for the box;

a plurality of removable, vertical, spaced baffles in the box extending between the sides, transverse to the direction of metal flow through the box, alternate ones of said baffles supported from the top and spaced from the base, the remaining intermediate baffles resting on the bottom surface and extending partially from said bottom surface



upward to define a serpentine pathway for the metal flow through the box; and

said base assembly also including a shaped, gas permeable block in the assembly, said block permeable to a sparging gas flow, said block having a portion thereof defining a plurality of discrete, surface areas for discharge of sparging gas into a molten metal stream in the box, said surface areas lying in the plane of the bottom surface; and

said block including means for transport of a gas flow through the block.

4,427,186

LIQUID-COOLED LANCE FOR BLOWING OXYGEN ONTO A STEEL BATH

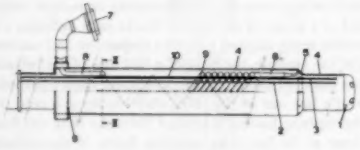
Gerardus P. Bührmann, Velsen-Zuid, Netherlands, assignor to Estel Hoogovens B.V., Ijmuiden, Netherlands

Filed Sep. 24, 1982, Ser. No. 423,440

Claims priority, application Netherlands, Oct. 1, 1981, 8104474

Int. Cl.³ C21C *5/32*

U.S. Cl. 266—225 **13 Claims**



1. In a liquid-cooled lance for blowing oxygen onto a bath of molten steel, the lance having a tip from which a primary supply of oxygen is blown onto the bath, a rear end opposite the tip, a central duct for the delivery of the primary supply of oxygen to the tip, a double tube system outside the said central duct for the supply and removal of cooling liquid, a plurality of secondary nozzles disposed around the periphery of the lance and axially spaced from the tip through which a secondary supply of oxygen is blown onto the bath and means for the delivery of the secondary supply of oxygen to the secondary nozzles, the improvement that the said means for the delivery of the secondary supply of oxygen comprises a plurality of separate supply conduits arranged in parallel within the lance, the said separate supply conduits for the secondary nozzles being connected to a common external oxygen supply conduit at the rear end of the lance.

4,427,187

SUPPORTS FOR PRODUCTS IN A STEEL-MAKING FURNACE

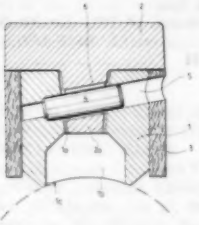
Michel Denis, Marly le Roi, France, assignor to Stein Heurtey Societe Anonyme, Ris Orangis, France

Filed Jun. 24, 1982, Ser. No. 391,862

Claims priority, application France, Jul. 1, 1981, 81 13205

Int. Cl.³ F27D *3/02*

U.S. Cl. 266—274 **9 Claims**



1. A support assembly for steel products in a furnace, comprising:

a water-cooled support extending horizontally in said furnace; and

at least one stud projecting upwardly from and mounted on said support for spacing said products from said support while carrying said products in said furnace, said stud comprising:

an upwardly extending cylindrical body having a base secured to said support, an upper part adapted to underlie said products and spaced from said base, and an outwardly peripheral recess extending from said base to said upper part but terminating below a contact surface between said upper part and said products, and

a cylindrical insulating envelope composed of fibrous material received in said recess and having substantially the same outer diameter as said upper part.

4,427,188

EXTENSIBLE STRUT FOR USE IN DEVICE SUCH AS A GAS SPRING

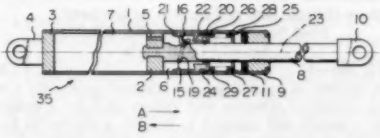
Akihiro Shimokura, Higashi Minemachi, and Tomio Imaizumi, Kawasaki, both of Japan, assignors to Tokico Ltd., Kawasaki, Japan

Filed May 28, 1982, Ser. No. 383,198

Claims priority, application Japan, Jun. 3, 1981, 56-81654[U]

Int. Cl.³ F16F *9/10, 9/32*

U.S. Cl. 267—64.12 **4 Claims**



1. An extensible strut comprising a cylinder, a rod guided by the cylinder and slidably extending to the outside through one end of the cylinder, said rod having first and second axially contiguous recesses provided in the outer circumference thereof, said recesses having oppositely inclined surfaces defining therebetween a projecting portion, a locking member selectively and rockingly located in either of said first and second recesses, said locking member having a generally V-shaped longitudinal cross-section and including first and second axially spaced and radially outwardly extending leg portions, resilient means for biasing said locking member radially

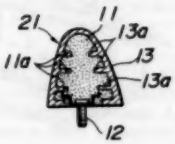
inwardly whereby said locking member snappingly moves between said first and second recesses, a retaining element provided in the cylinder and projecting radially inwardly, and a releasing element provided in the cylinder and projecting radially inwardly by an amount larger than that of the retaining element, said retaining element and releasing element being spaced axially by an amount larger than that between the first and second leg portions of the locking member, the arrangement being such that when the locking member is located in the second recess and between the retaining and locking elements, the first leg portion is adapted to engage with the retaining element thereby preventing the movement of the rod in one direction and the second leg portion is adapted to engage with the releasing element in response to the movement of the rod in the other direction whereby the locking member is moved to the first recess.

4,427,189

SHOCK ABSORBING ASSEMBLY

Toshimitsu Kimura, Fujisawa, and Yutaka Ohmura, Zushi, both of Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan

Continuation of Ser. No. 155,024, Jun. 2, 1980, abandoned. This application Aug. 5, 1982, Ser. No. 405,628
Claims priority, application Japan, Jun. 4, 1979, 54-70452
Int. Cl.³ F16F 1/37
U.S. Cl. 267—139 **1 Claim**



1. A shock absorbing assembly comprising a core member having a sidewall extending longitudinally between proximal and distal ends and being molded of a low density elastomeric material, fastening means for mounting the assembly such as a stud bolt, nut or the like inserted before molding and embedded in the proximal end of said core member, said core member being formed with a plurality of longitudinally spaced annular anchoring grooves extending substantially inwardly and positioned on said sidewall between the proximal and distal ends, and a cover member molded of a high density elastomeric material enclosing therein said core member inserted before molding said cover member, the inner surfaces of said cover member overlying the sidewall of the core being formed with a plurality of similarly longitudinally spaced ridges engaging the anchoring grooves of said core member, said ridges extending substantially inwardly sufficient to restrain deformation of said core member.

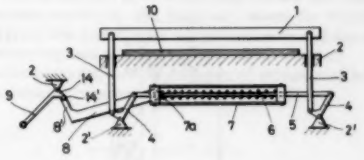
4,427,190

APPARATUS FOR PRESSURE ATTACHING CONVEYOR BELT CONNECTORS

Hermann Stolz, Muehlheim, Fed. Rep. of Germany, assignor to Mato Maschinen- und Metallwarenfabrik Curt Matthaei GmbH & Co. KG, Offenbach, Fed. Rep. of Germany

Filed Sep. 10, 1981, Ser. No. 300,815
Claims priority, application Fed. Rep. of Germany, Oct. 24, 1980, 3040092
Int. Cl.³ B25B 1/14
U.S. Cl. 269—32 **4 Claims**

1. In an apparatus for attaching, by means of pressure, connector elements to the ends of a conveyor belt, having frame means (2'), first and second clamping rails (1, 2) one of which is movable relative to the other for clamping a belt end between the two clamping rails into a fixed position for said attaching, a clamping mechanism including rocking lever means (4) pivoted to said frame means, tie rod means (3) for movably securing said movable clamping rail (1) to the rocking lever means (4), pull rod means (5), means (6, 7) including biasing spring means (6) operatively connected to said rocking lever means (4), the improvement comprising a single clamping lever (9) and toggle means having a dead point operatively connecting said single clamping lever (9) to said pull rod means (5) for clamping and releasing said movable rail relative to the other rail, at least one of said clamping rails being hollow, said clamping mechanism being mounted inside said hollow clamping rail, and wherein said toggle means comprise a first toggle member (8) forming a tensioning bar for said spring means (6) and a second toggle member (14) having its one end rigidly connected to said single clamping lever (9) and its other end pivoted (at 14') to said first toggle member (8), said first and second toggle members (8 and 14) being so positioned relative to each other that said pivoted end (14') is moved beyond the dead point of the toggle means for self-locking of the toggle means which prevents an unwanted release of the single clamping lever (9) and for a self-locking closing of the clamping mechanism.

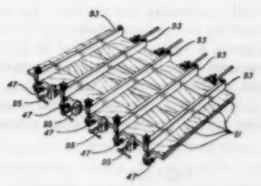


4,427,191

PANEL CLAMP

Stanley E. Hess, 320 W. Fourth St., Ashland, Ohio 44805

Filed Jun. 24, 1982, Ser. No. 391,493
Int. Cl.³ B25B 1/20
U.S. Cl. 269—43 **7 Claims**



1. A clamp preventing warping of a panel formed from edge-glued boards, during gluing of said boards, said clamp comprising:

first and second opposing jaw means for maintaining boards in lateral registration, each jaw means being tubular and having a central longitudinal axis and opposing first and second ends, said respective first and second ends of said first and second jaw means opposing each other, respectively;

adjustment means, proximate each of said respective opposed first and second ends of said jaw means, for engaging said jaw means, adjusting the separation of said jaw means and retaining said jaw means in position during use, said adjustment means comprising first threaded nut means for engaging a threaded article, said nut means being disposed within and being attached to said first jaw member offset from said axis proximate said first end of said first jaw member, a threaded rod for engaging said first nut means, said rod having a head, and said second jaw member includes, proximate its first end, an aperture

for receiving said rod to engage said head and said second jaw member.

4,427,192

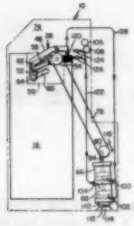
DISPENSER VACUUM SYSTEM

Richard T. Kushmaul, Dallas, and James E. Webb, Richardson, both of Tex., assignors to Docutel Corporation, Irving, Tex.

Filed Aug. 31, 1981, Ser. No. 297,613

Int. Cl.³ B65H *3/08*

U.S. Cl. 271—11 **10 Claims**



4. A vacuum/pressure supply for a document dispenser having a vacuum cup as part of a picker head for removing a document from a stack, comprising in combination:

a cylinder having first and second chambers each containing a sliding piston,

means for interconnecting the piston of each chamber into a single operating unit,

a first port in each chamber opening therein on the same side of the piston in the respective chamber,

a manifold for interconnecting the first port of each chamber into a single vacuum/pressure supply source,

means for interconnecting said manifold to the vacuum cup of the picker head,

means for driving the pistons of each chamber relative to the respective chamber and the picker head for removing a document from the stack, and

means for pivotally mounting the cylinder for oscillating action when driving the pistons relative to the respective chambers, wherein a vacuum is applied to said vacuum cup by said vacuum/pressure supply source during a first portion of said oscillating action, said vacuum/pressure supply source applying a pressure to said vacuum cup during a second portion of said oscillating action.

4,427,193

SHEET GRIPPING ARRANGEMENT

Peter Kahlert; Helmut Schöne; Hans Johne, all of Radebeul; Arndt Jentzsch; Victor Hefftler, both of Coswig; Werner Kühnert, Radebeul; Rainer Karl, Coswig; Norbert Dittmann; Heiner Fink, both of Dresden, and Karl-Heinz Preussger, Meissen, all of German Democratic Rep., assignors to Veb Kombinat Polygraph "Werner Lamberz" Leipzig, Leipzig, German Democratic Rep.

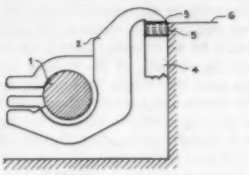
Filed Oct. 20, 1980, Ser. No. 199,044

Claims priority, application German Democratic Rep., Oct. 25, 1979, 216448

Int. Cl.³ B65H *29/06*

U.S. Cl. 271—277 **11 Claims**

1. A sheet gripping arrangement for sheet-processing machines, comprising a sheet-gripping member having an outer sheet-supporting surface contacting a sheet being processed and a counter sheet-gripping member having a counter sheet-supporting surface, said sheet-gripping member and said counter sheet-gripping member holding a sheet being processed in a predetermined traveling direction, said outer sheet-supporting surface including a plurality of projections positioned in a first and a second rows, at least one of said rows being inclined to said predetermined traveling direction, said first and second rows extending skew to one another so as to



form an oblique raster, each of said projections having the shape of a slim truncated cone.

4,427,194

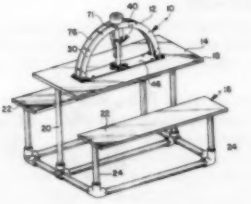
APPARATUS FOR USE IN ARM WRESTLING OR WRIST PULLING CONTESTS

Exsior Dion, 547 River Rd., Lincoln, R.I. 02865

Filed Dec. 28, 1982, Ser. No. 454,043

Int. Cl.³ A63B *21/28, 71/00*

U.S. Cl. 273—1 GC **8 Claims**



1. Apparatus for conducting arm wrestling contest between a pair of opposed contestants comprising a frame adapted for upright positioning on a contest surface and defining an arcuately-shaped track, an elongated lever arm having upper and lower ends, said lever arm pivotally supported at its lower end proximate said contest surface and engaged in said track at its upper end for side-to-side arcuate movement within the limits defined by said frame, said arm including a pair of laterally spaced hand grip portions positioned along the extent of said arm intermediate the ends thereof, signal means including activation means positioned on said frame at the opposite ends of said track for contact by said arm when moved to either of its side-to-side limits for activating said signal means.

8. The apparatus of claim **1** in combination with a table and opposed benches which elevate contestants sitting on said benches such that their legs cannot reach the ground or be braced to the table or bench legs or can their inactive arms reach the table corners and the like.

4,427,195

TENNIS RACKET WITH VARIABLE BALANCE AND WEIGHT

Paul F. M. Hufenus, 16 rue de la Costa, 34 110 Frontignan, France

Continuation of Ser. No. 776,726, Mar. 11, 1977, abandoned, which is a division of Ser. No. 537,105, Dec. 23, 1974, Pat. No. 4,027,881. This application May 2, 1979, Ser. No. 35,387

Int. Cl.³ A63B *49/12, 49/08*

U.S. Cl. 273—73 J **6 Claims**

1. Tennis racket comprising a frame and a handle attached to said frame, said frame having a base adjacent the handle, and a portion remote from said handle, said handle comprising a grip at the end thereof remote from the base of said frame, an elongated guide member extending between said grip and the

base of the frame, a movable member slidably mounted on said guide member, and means for releasably retaining said movable member at any one of a plurality of different positions along said guide member, said frame comprising a weight at the portion remote from the handle such that the center of gravity of the racket is situated between the geometric center of the

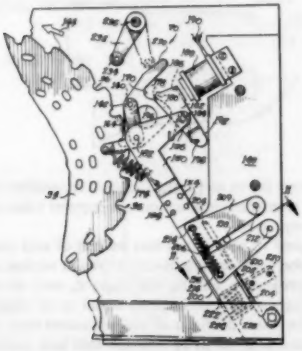
frame and the base of the frame at a distance less than 5 cm from said geometric center when said movable member is closest to the base of the frame, wherein said handle has a longitudinal opening between said frame and grip, and means for removably attaching the ends of said guide member to said frame and grip respectively, said attaching means comprising screw means for adjusting the tension of said guide means.

4,427,196

ROTATABLE REEL INDEXING HAVING SHOCK ABSORBING CAPABILITY

Donald E. Hooker, Wilmette, and Roman A. Tojza, Chicago, both of Ill., assignors to Bally Manufacturing Corporation, Chicago, Ill.

Division of Ser. No. 119,217, Feb. 7, 1980, abandoned. This application Sep. 25, 1981, Ser. No. 305,480
Int. Cl.³ A63F *5/04*
U.S. Cl. 273—143 R **27 Claims**



1. Apparatus for stopping a rotatable reel of the type that is used in an amusement or game device and which has at least one associated circular disc with a plurality of recessed notches positioned along the circumference thereof, said notches being adapted to receive a stop member for stopping rotation of the disc and reel, said apparatus comprising:

mounting means for attaching said apparatus to a frame structure of said game device;

index arm means movably attached to said mounting means and having a portion located immediately adjacent the circumference of said disc, said portion being movable in opposite directions from a rest position along a path that is generally tangent to the circumference of said disc at the location where said stop member engages a notch;

means for biasing said index arm means so that said portion is biased toward said rest position;

pivot arm means attached to said portion of said index arm means and being pivotable relative thereto, said pivot arm means carrying said stop member which engages one of said notches when said pivot arm means is pivoted toward said disc;

means for biasing said pivot arm means toward said disc;

latch means carried by said index arm means for retaining said pivot arm means out of engagement with said disc and for releasing said pivot arm means when operated;

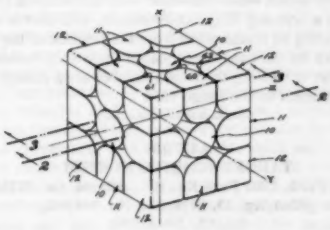
means for operating said latch means to release said index arm means in response to activation thereof.

4,427,197

CONSTRUCTION FOR THREE DIMENSIONAL LOGICAL TOY

Paul R. Doose, 1903 Greenfield Ave., Los Angeles, Calif. 90025

Filed Nov. 16, 1981, Ser. No. 321,767
Int. Cl.³ A63F *9/08*
U.S. Cl. 273—153 S **22 Claims**



1. A game cube of selectively moveable surface blocks and each side of the cube comprised of a center block, four corner blocks and an edge block adjacent the center block between each pair of corner blocks, the corner and edge blocks of adjacent sides of the cube being common one with the other,

a cross disposed within the moveable surface blocks and with oppositely extending legs on three right angularly related axes and means rotatably coupling the center blocks to said cross,

the cube being truncated on three parallel pairs of right angularly related planes separating the said moveable surface blocks each with an identifiable face exposed at the exterior of the cube and with adjacent interface sides slideable one against the other, the inner sides of the center blocks and inner edges of the edge blocks together forming a spherical internal cavity with inwardly disposed bearing races at the planes of truncation,

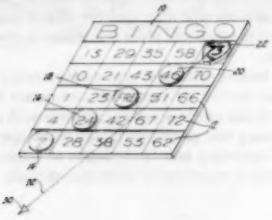
there being anchors extending inwardly from the edge blocks and corner blocks and having outwardly disposed shoulders slideable against the bearing races, for separate rotatable movement of groups of blocks comprising each side of the cube,

and an interface side of at least one of said surface blocks having an inclined truncated surface with an apex at the bearing race of any one of said center blocks to engage with a next adjacent interface side of a block slideable thereagainst.

4,427,198
BINGO GAME WITH SPECIAL MARKER

Kenneth LaRue, 33508 Edmonton, Farmington Hills, Mich. 48204

Filed Jun. 29, 1981, Ser. No. 278,756
Int. Cl.³ A63F 3/06
U.S. Cl. 273—269 4 Claims

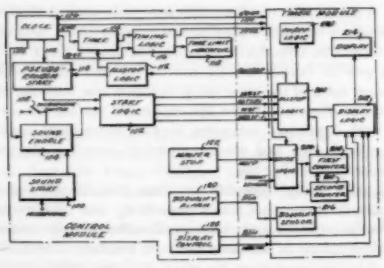


1. In combination:
a Bingo card having an array of numbers arranged in five rows, each row having five numbers;
at least three relatively thin bingo markers removably disposed on at least three selected numbers on the card for covering such numbers, said first bingo markers having a first thickness;
a fourth Bingo marker formed of a transparent material and having a second thickness substantially greater than said fourth thickness, and disposed on the Bingo card on a fifth number which when combined with said selected numbers forms a winning Bingo combination, said fourth marker presenting an image offset from the position of the fourth number on the card when placed upon such number and the user is viewing the fourth number at an oblique angle with respect to the Bingo card.

4,427,199
TARGET SCORING SYSTEM

Donald L. Faith, 1503 Park Rd., SE., Atlanta, Ga. 30315

Filed Sep. 13, 1978, Ser. No. 941,948
Int. Cl.³ F41J 5/06
U.S. Cl. 273—371 23 Claims



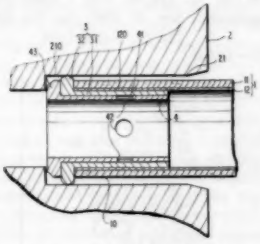
1. A system for scoring hit targets, each including a sensor for producing a hit signal when said target is hit by a projectile from a marksman, comprising:
a control module including means for producing a start signal and, a given time thereafter, a stop signal and means for manually setting said given time; and
a plurality of timer modules each connected to said control module and to at least one sensor including first counter means for counting a predetermined number of hit signals between said start and stop signals, second counter means for counting the time, between said start signal and said stop signal, required to count said predetermined number of hit signals, means for manually choosing and setting said predetermined number from a plurality of numbers, and means for displaying the counted number of hits and time.

17. A system for scoring hit targets, each including a sensor for producing a hit signal when said target is hit by a projectile, at least one of said targets producing a disqualify signal when hit by a projectile, comprising:
means for producing a start signal including first means responsive to a sound for producing sid start signal and second means responsive to the counting of a given number for producing said start signal and switch means for enabling said first means and disabling said second means in a first condition and disabling said first means and enabling said second means in a second condition;
means connected to said start signal producing means and adapted for connection to said sensors for counting hit signals produced after said start signal; and
means for disabling said counting means and producing an indication when said disqualify signal is produced.

4,427,200
SEAL STRUCTURE OF END PART OF LIQUID SEPARATION TUBE

Norio Ikeyama; Nobuo Sotoma, and Shusaku Tamaru, all of Osaka, Japan, assignors to Nitto Electric Industrial Co., Ltd., Osaka, Japan

Filed Feb. 10, 1982, Ser. No. 347,614
Claims priority, application Japan, Feb. 24, 1981, 56-26663; Feb. 24, 1981, 56-26664
Int. Cl.³ F16J 15/46
U.S. Cl. 277—3 10 Claims



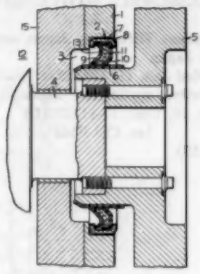
1. A seal structure for an end part of a liquid separation tube having a tubular membrane inside a porous support tube, said seal structure comprising:
a packing adapted to be inserted into an end of said liquid separation tube, said packing having a tubular section and an annular projection on the end thereof, said tubular section having an outside diameter equal to or slightly larger than the inside diameter of said separation tube; and
a tubular adapter adapted to be inserted into said packing and having an outside diameter equal to or slightly larger than the inside diameter of said packing, said adapter having at least one passageway in the wall thereof comunicating with at least one annular groove formed in the outer circumferential wall of said adapter or the inner circumferential wall of said packing,
whereby when liquid under pressure is passed through said separation tube, the liquid fills said annular groove and compresses said packing against the inside of said separation tube, forming a seal.

4,427,201

DOUBLE SEAL HAVING VIBRATION DAMPING AND LUBRICATING MEANS

James F. Belsanti, Blue Island, Ill., assignor to Allis-Chalmers Corporation, Milwaukee, Wis.

Filed Aug. 30, 1982, Ser. No. 412,823
Int. Cl.³ F16J 15/16, 15/32
U.S. Cl. 277—24 10 Claims



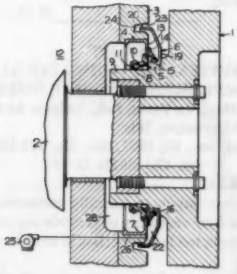
1. A combination seal assembly comprising, a stationary means, a rotating member rotating within said stationary means, a combination seal mounted on said stationary means and engaging said rotating member including, a seal support for supporting said seal on said stationary means, a primary seal lip providing an internal oil seal, a secondary seal lip providing an external seal, an intermediate oil permeated medium forming an interface with said primary seal lip and said secondary seal lip and lubricating said secondary seal lip, means defining perforations in said primary seal lip to allow oil to permeate said medium, said seal combination thereby providing a primary internal oil seal and a secondary external dust seal on said rotating member.

4,427,202

COMBINATION STATIC OIL SEAL AND ROTARY DUST SEAL

Robert R. Backlin, Crete, Ill., assignor to Allis-Chalmers Corporation, Milwaukee, Wis.

Filed Aug. 30, 1982, Ser. No. 412,829
Int. Cl.³ F16J 15/32, 15/38
U.S. Cl. 277—68 10 Claims



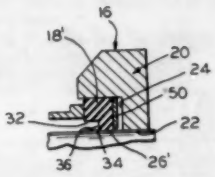
1. A combination oil seal and dust seal assembly comprising, a stationary means, a rotating member, an oil seal mounted on said stationary means engaging said rotating member, a dust seal carried on said rotating member and engaging said stationary means, a dust slinger carried on said rotating member shielding said dust seal and thereby providing a combination seal assembly between said stationary means and said rotating member.

4,427,203

SEALING ASSEMBLY FOR ROTATABLE SHAFTS

Jesse W. Eacue, 1010 Buell Ave., Joliet, Ill. 60435

Filed Jul. 21, 1982, Ser. No. 400,910
Int. Cl.³ F16J 15/34, 15/40, 15/54
U.S. Cl. 277—81 R 16 Claims



1. A sealing assembly for use in a high pressure environment with a device having a rotatable shaft, comprising:

stationary seal means associated with said device and having an opening generally conforming to said rotatable shaft; and

rotatable seal means including means facing said high pressure environment for engaging and cooperating with said stationery seal means for effecting a seal therebetween, said rotatable seal means being adapted to be mounted on said rotatable shaft for rotational movement therewith, said rotatable seal means including means facing said high pressure environment for engaging and cooperating with said rotatable shaft for effecting a seal therebetween;

said rotatable seal means also including a collar having an opening generally conforming to said rotatable shaft, said collar having a recess surrounding said opening dimensioned larger than said opening to receive a seal insert, said seal insert having an opening generally conforming to said rotatable shaft comprising at least a portion of said means facing said high pressure environment for engaging and cooperating with said rotatable shaft, said stationery seal means having a sealing surface adapted to cooperate with a corresponding surface of said seal insert, said corresponding surface of said seal insert comprising said means facing said high pressure environment for engaging and cooperating with said stationery seal means for effecting a seal therebetween, said corresponding surface of said seal insert having a groove defining a lip facing said high pressure environment so as to be formed under pressure into sealing engagement with said rotatable shaft, said lip being defined in part by a surface defining said shaft conforming opening in said seal insert and also being defined in part by a surface defining a portion of said groove.

4,427,204

MECHANICAL END FACE SEAL

David W. Alley, Rte. #1, Box 1003, Hemphill, Tex. 75948

Filed Jan. 17, 1983, Ser. No. 458,180
Int. Cl.³ F16J 15/34
U.S. Cl. 277—85 20 Claims

1. A mechanical end face seal assembly for a rotary shaft comprising;

a cylindrical stationary seat surrounding said shaft, having a central bore and at least one sealing end face,

a cylindrical washer surrounding said shaft and movable longitudinally thereof into sealing engagement with said seat end face,

said washer having a central bore and a sealing face at one end engageable with said seat end face and having a counterbore at the other end,

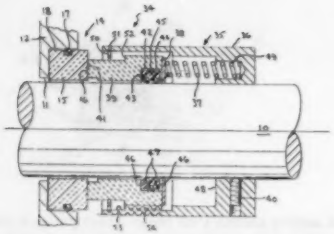
a hollow cylindrical O-ring retainer surrounding said shaft and positioned within said washer counterbore,

said O-ring retainer having a centrally located peripheral groove on its outer surface and at least two laterally-

spaced, substantially-parallel, peripheral grooves in the inner surface thereof,

an O-ring positioned in said O-ring retainer outer groove to form a seal between said outer surface of said O-ring retainer and said washer counterbore,

a plurality of O-rings positioned one in each of said inner



surface grooves in said O-ring retainer to form a seal between the outside diameter of said shaft and said O-ring holder and supporting said retainer on said shaft with substantially no wear thereon during extended periods of operation, and

spring means biasing said washer longitudinally of said shaft into sealing engagement with said seat.

4,427,205

RADIAL SHAFT SEALING RING

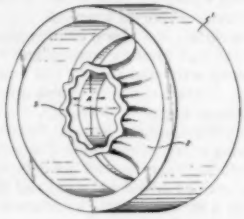
Helmut Hölzer, Weinheim, and Peter Ehrmann, Hemsbach, both of Fed. Rep. of Germany, assignors to Firma Carl Freudenberg, Weinheim, Fed. Rep. of Germany

Filed Jul. 19, 1982, Ser. No. 399,798

Claims priority, application Fed. Rep. of Germany, Dec. 19, 1981, 3150472

Int. Cl.³ F16J *15/32*

U.S. Cl. 277—134 **11 Claims**



1. A radial shaft sealing ring for sealing off a medium comprising:

a holding ring surrounding said shaft;

a flat circular sealing element fabricated from a polymer material having an outer circumferential region and a bore therethrough defining an inner circumference for providing a passage for said shaft; wherein,

said outer circumferential region of said sealing element is mounted in said holding ring;

said sealing element is curved from said outer circumferential region to said inner circumference in the direction toward said sealed-off medium whereby said sealing element surrounds said shaft with a variable inside diameter;

said sealing element is expanded away from said shaft in the region adjacent said inner circumference;

said sealing element contacts said shaft intermediate said outer circumferential region and said inner circumference thereby providing a circular sealing contact area wherein said sealing element is absent additional mechanical means urging compressive contact of said sealing element with said shaft intermediate said inner circumferential region and said outer circumferential region; whereby

said sealing element curvature provides an increasing inside diameter of said sealing element along the axial distance of said shaft from said circular sealing contact area to said expanded inner circumference.

4,427,206

OIL SEAL ASSEMBLY WITH UNBONDED BACKUP RING

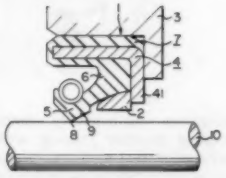
Masahiro Sugiyama, Hiratsuka, Japan, assignor to Keeper Co., Ltd., Tokyo, Japan

Filed Jun. 13, 1983, Ser. No. 503,559

Claims priority, application Japan, Jul. 20, 1982, 57-108884[U]; Jul. 26, 1982, 57-112220[U]

Int. Cl.³ F16J *15/32*

U.S. Cl. 277—153 **3 Claims**



1. An oil seal assembly for forming a seal between a wall of a machine housing and a rotatable shaft extending through said wall to prevent a fluid from leaking from inside to the outside of said housing through the gap between said wall and said shaft, said oil seal assembly comprising:

an elastic seal ring made of an elastic material and having a base portion for fitting to said wall, a lip portion with a lip edge for resilient sliding contact with the surface of said shaft, and a lip neck portion through which said lip portion is connected to said base portion;

a reinforcement member made of a comparatively stiff material and associated with said base portion of said elastic seal ring; and

a backup ring made of a synthetic resin and seated in a gap formed between the inner peripheral surface of said lip neck portion and the radially inward portion of said reinforcement ring without being bonded to said lip neck portion and to said radially inward portion of said reinforcement ring.

4,427,207

HYDRAULIC SYSTEM PROVIDING EQUALIZED LOAD ON IMPLEMENT SUPPORT WHEELS

Alexander T. Gafford, La Porte, Ind., assignor to Allis-Chalmers Corporation, Milwaukee, Wis.

Filed Nov. 13, 1981, Ser. No. 321,318

Int. Cl.³ B62D *33/08*

U.S. Cl. 280—43.23 **3 Claims**

1. An implement having a laterally extending frame, supported on at least four vertically adjustable support wheels and adapted to be connected in draft relation to a tractor characterized by,

first and second laterally spaced pairs of wheel supports rotatably supporting said wheels and pivotally connected to laterally spaced points on said frame for individual vertical swinging movement about axes transverse to the direction of movement of said implement when supported by said wheels,

first and second double-acting hydraulic master cylinders operatively interposed between said frame and said first pair of said wheel supports,

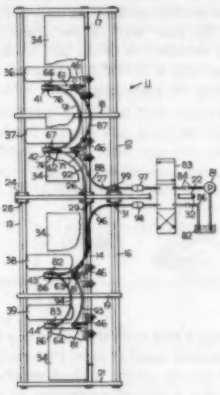
first and second hydraulic slave cylinders operatively inter-

posed between said frame and said second pair of wheel supports,

a source of pressurized hydraulic fluid including a pump and fluid reservoir,

conduit means connecting first corresponding ends of said master cylinders in parallel to said source of pressurized hydraulic fluid,

conduit means connecting second corresponding ends of said master cylinders in parallel,



conduit means connecting first corresponding ends of said slave cylinders in parallel, and

conduit means connecting said second corresponding ends of said master cylinders in series with said first corresponding ends of said slave cylinders,

said master and slave cylinders being operable to evenly raise and lower said frame and the parallel connections of said master and slave cylinders providing equalized load upon said support wheels.

4,427,208

MUDGUARD

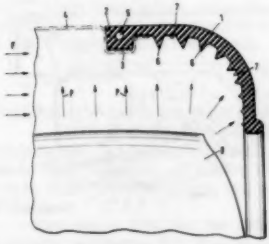
Heinz-Henning Jürges, Am Rugen End 13, D - 2150 Buxtehude, Fed. Rep. of Germany

Filed Apr. 1, 1982, Ser. No. 364,253

Claims priority, application Fed. Rep. of Germany, Apr. 8, 1981, 8110658

Int. Cl.³ B62B *9/16*

U.S. Cl. 280—153 R **5 Claims**



1. A mudguard for motor vehicles, especially heavy goods vehicles, comprising an arched portion adapted to be mounted to the vehicle above the tire thereof and a splash protection edge having in cross-section an arcuate section and a radially drawn in section facing the tire, said splash protection edge having a plurality of ribs on its inner surface facing the tire and extending in the peripheral direction of the tire rotation, the height of each rib and the spacing between successive ribs decreasing outwardly from said vehicle.

4,427,209

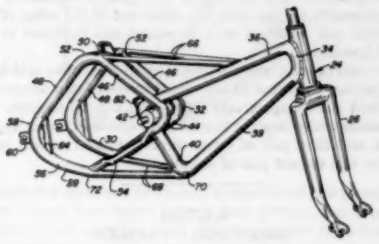
BICYCLE FRAME

Norimasa Morita, 420 Shizuoka, Hontori 7-2-11 Orange Mansion 4FB, Shizuoka, Japan

Filed Feb. 16, 1982, Ser. No. 349,056

Int. Cl.³ B62K *3/00, 19/30*

U.S. Cl. 280—281 R **13 Claims**



1. A bicycle frame comprising a looped tube assembly having a front tube loop, a pair of spaced, parallel rear tube loops, and an interconnection means for interconnecting said front tube loop and said pair of rear tube loops, wherein said front tube loop has connected thereto a conventional head tube and front fork assembly, said front tube loop with said head tube forming a substantially quadrilateral structure with upper and lower rearward bends; each of said rear tube loops form substantially quadrilateral structures of generally diamond shape with top and bottom, and front and rear bends; and, wherein said means for interconnecting said front tube loop and said pair or rear tube loops comprises an interconnecting structural device which engages the inside of the upper rearward bend of said front tube loop and the inside of the front bends of said tube loops which are arranged on each side of said upper rearward bend of said front tube loop.

4,427,210

WHEELCHAIR AND OCCUPANT RESTRAINT SYSTEM

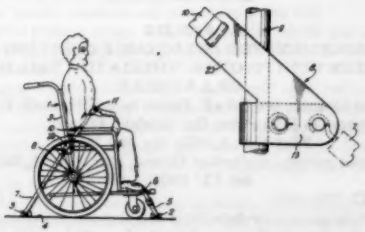
Henk Wevers, Kingston, Canada, assignor to Queen's University at Kingston, Kingston, Canada

Filed Sep. 17, 1982, Ser. No. 419,382

Claims priority, application Canada, Mar. 2, 1982, 397403

Int. Cl.³ B60P *7/08;* **A62B** *35/00*

U.S. Cl. 280—289 WC **5 Claims**



1. A wheelchair tie down apparatus for use in a vehicle provided with anchor means, in a designated tie down floor area, adjacent each corner of said wheelchair, comprising:

a pair of bracket means each arranged for mounting on

respective laterally spaced apart frame members of said wheelchair, adjacent the rear and seat thereof;

a first pair of flexible straps, each strap having a tethered end for connection to a respective one of said anchor means adjacent the front of said wheelchair, and a distal end having a wheelchair engaging means;

a second pair of flexible straps, each strap having a tethered end for connection to a respective one of said anchor means adjacent the rear of said wheelchair, and a distal end having means for engaging said bracket means;

a third pair of flexible straps, each strap having a tethered end connected to a respective one of said bracket means and extendible around the hips of an occupant in said wheelchair to a distal end arranged to releasably and adjustably engage with the distal end of the other of said third pair of straps so as to secure said occupant in said wheelchair;

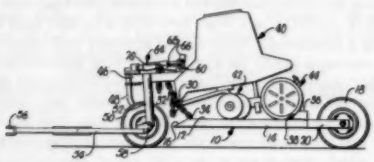
each said bracket being arranged on its respective said frame member such that its associated straps of said second and third pairs respectively lie, in operational position, in a substantially straight line so as to transmit forces applied to said third pair of straps directly to said anchor means for said second pair of straps.

4,427,211

GRAIN DRILL TRAILER

Charles Bruna, and Lynn Bruna, both of Rte. 4, Marysville, Kans. 66508

Filed Jun. 17, 1982, Ser. No. 389,176
Int. Cl.³ B60P *3/06*
U.S. Cl. 280—402 **11 Claims**



11. In combination, a machine to be transported and a carrier for said machine,

said machine being provided with ground wheel means,

said carrier including a bed having a pair of ends and ground wheel means at one of said ends,

said bed normally sloping upwardly toward its wheel means with the opposite of said ends resting on the ground; and

means on the machine for raising said opposite end off the ground after the machine is loaded on the bed while leaving the wheel means of the machine on the ground whereby, upon placement of the machine and carrier under tow as a unit, the wheel means of both the carrier and the machine become rolling supports for said unit.

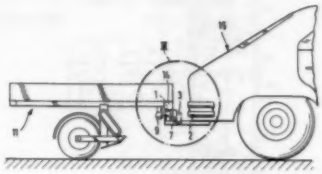
4,427,212

ARRANGEMENT FOR DETACHABLE COUPLING OF A TRAILER WITH PIVOTING WHEELS TO A BALL HITCH OF A VEHICLE

Veikko Levåaho, and Esko K. Poltto, both of Helsinki, Finland, assignors to Esko Poltto Oy, Helsinki, Finland

Filed Mar. 3, 1982, Ser. No. 354,166
Claims priority, application Finland, Mar. 5, 1981, 810696
Int. Cl.³ B60D *1/06*
U.S. Cl. 280—511 **2 Claims**

2. Arrangement for detachable coupling of a trailer equipped with pivoting wheels to a ball hitch of a vehicle, said arrangement comprising: a coupling receptacle at the forward end of the trailer to receive the ball hitch; a locking member to lock the ball hitch in the coupling receptacle; and means to prevent the trailer from rotating about a vertical axis through the ball hitch, said means for preventing rotation of the trailer about a vertical axis through the ball hitch comprising at least two opposing stops fitted at the forward end of the trailer at such a distance from each other in the lateral direction that when the trailer is coupled to the ball hitch of the vehicle the stops bear or can be brought to bear against corresponding opposing stop faces at the rear of the vehicle; a rear wall of the coupling receptacle being open at least in its lower part and the locking member being a swivelling arched member partially encircling the coupling receptacle and pivotally attached to the coupling receptacle by means of a lateral axle so that in one of its extreme positions said arched member at least partially encloses the open part of the rear wall of the coupling receptacle thereby preventing detachment of the ball hitch; the arrangement further comprising a lateral bar adapted to be pushed back and forth along its own length and which has a first



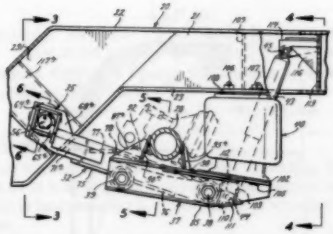
projection, so arranged that with the bar in one extreme position and with the arched member in its lock position said first projection extends on top of the arched member or a fixed extension thereof, and a second projection of essentially L-form in cross-section, said second projection being at such a distance from the first projection that with the bar in its other extreme position, in which position the first projection has been moved from on top of the arched member or its fixed extension, said second projection is pushed under the arched member or its fixed extension in order to raise the arched member; the essentially vertical part of the L-shaped second projection being bevelled on that edge which is towards the arched member and of such a height that the arched member is turned upwards sufficiently for the ball hitch to be detached from the coupling receptacle.

4,427,213

VEHICLE SUSPENSION WITH RIGID TORQUE BEAM

John E. Raidel, Jr., 2553 S. Pickwick, Springfield, Mo. 65804

Filed Jan. 21, 1982, Ser. No. 341,445
Int. Cl.³ B10K *23/00*
U.S. Cl. 280—711 **8 Claims**



1. In a vehicle suspension assemby for a vehicle having a frame: a torque beam adapted to be secured to the vehicle frame at a first point; a spring also adapted to be secured to the vehicle frame at a second point spaced from the first point; a first resilient bushing having an outer sleeve adapted to be firmly secured to the frame; an inner sleeve, an elastomeric sleeve between the outer and inner sleeve; a pivot extending through the inner sleeve, and initially rotatable therein; the

torque beam having spaced arms at its end, one extending across each end of the inner sleeve, means for non-rotatably connecting the said arms to the pivot, so as to restrain rocking movement of the arms relatively to the inner sleeve; the torque beam arms extending from the first point toward the second point, and converting to a closer relation; means connecting the two arms to form a box-like torque beam; a buffer beam; a second resilient bushing connecting the end of the torque beam near the second point, to the buffer beam, and another third resilient bushing connecting the two beams between the first and second points; the spring being attached to the buffer beam beyond the torque beam, and means to connect the buffer beam between its resilient bushings to an axle housing.

4,427,214

PROTECTIVE DEVICE FOR MOTORCYCLES

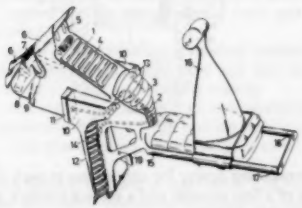
Björn Häggkvist, 7 Siverts Väg, S-132 00 Saltsjö-Boo, Sweden

Filed Jul. 14, 1981, Ser. No. 283,230

Claims priority, application Sweden, Jul. 14, 1980, 8005146

Int. Cl.³ B60R *21/04*; B62J *17/02, 27/00*

U.S. Cl. 280—752 **4 Claims**



1. An arrangement in motorcycles for protecting a motor cyclist against injury in the event of a collision, comprising a protective body (1) mounted to the motorcycle in front of the driving seat by means of attachment devices and extending forwards to at least the handle-bars of said motorcycle, and having a cushioning surface (2,3,4) which faces the upper part of the body of the motor cyclist, whereat the forward part (6) of the protective body remote from the motor cyclist forms an energy-absorbing deformation zone, characterized in that said cushioning surface (2,3,4) projects in a vertical plane and has an area of at least 500 cm^2, and is of such shape and so inclined that when the upper part of a motor cyclists' body lies against said surface, it forms an upwardly directed angle of at least 20° with a horizontal plane; that the part of the protective body nearest the motor cyclist is provided with support portions (13) lying over the thighs and knees of the motor cyclist; that the attachment means are arranged to break at a given load; and that means (9) are provided which, when the protective body (1) moves relative to the motorcycle, act on the handle-bars in a manner which causes them to break loose.

4,427,215

PASSIVE LOWER BODY RESTRAINT FOR AUTOMOTIVE VEHICLES

Albert Weichenrieder, Geisenfeld; Horst Krammel, Wettstetten, and Claude Rion, Ingolstadt, all of Fed. Rep. of Germany, assignors to Audi NSU Auto Union AG, Neckarsulm, Fed. Rep. of Germany

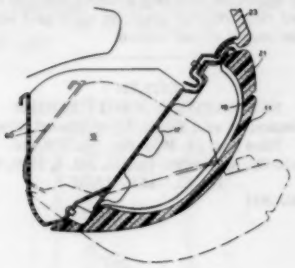
Filed Aug. 6, 1981, Ser. No. 290,507

Claims priority, application Fed. Rep. of Germany, Aug. 7, 1980, 3029913

Int. Cl.³ B60R *21/04*

U.S. Cl. 280—752 **4 Claims**

1. In an automotive vehicle having a passenger compartment, a dashboard at a front seat in said compartment spaced from said dashboard, the improvement which comprises the combination therewith of a restraining member affixed to a lower portion of said dashboard, said restraining member being positioned to engage the knees of a passenger seated on said seat for restraining forward movement of the lower portion of the torso of said passenger, said restraining member being composed of a body deformable by the knees of said passenger to dissipate energy of forward movement of the passenger, hinge means for swingably mounting of at least a portion of



said member upon said dashboard at one side of said member to afford access to a region behind said portion, and a profile portion on an opposite side of said member form-fittingly hooking into a complementary portion on said dashboard to prevent relative slipping of said member and said dashboard upon the application of force to said member by the knees of said passenger.

4,427,216

SEAT BELT TENSIONING DEVICE

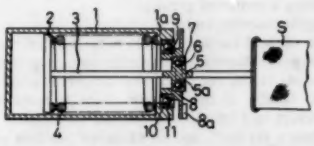
Masahiko Kato, Okazaki, and Tetsuro Kikuchi, Nukata, both of Japan, assignors to Nippon Soken, Inc., Nishio, Japan

Filed Aug. 13, 1981, Ser. No. 292,535

Claims priority, application Japan, Nov. 5, 1980, 55-158338[U]

Int. Cl.³ B60R *21/10*

U.S. Cl. 280—806 **11 Claims**



1. A seat belt tensioning device which is installed in a vehicle, comprises:

a cylinder having a bottomed end and an open end;

a piston which is slidably inserted within said cylinder so as to move in one direction therealong;

a rod which connects said piston and a seat belt;

a piston pushing means which is provided within said cylinder for applying driving force to said piston in said one direction;

a trigger means which is provided in said open end of said cylinder for usually locking said rod into said cylinder overcoming said driving force of said piston pushing means and releasing said rod from said cylinder to allow the movement of said piston only at an urgent time such as upon a vehicle impact;

said trigger means comprising an annular ball bearing which is installed between inner wall of said cylinder in said open end thereof and said rod which is inserted within said cylinder, said annular ball bearing being composed of a plurality of rings which are engaged so as to be relatively rotatable and balls interposed between opposed rings, and include an innermost ring fixed to said rod and an outermost ring fixed to said inner wall of said cylinder;

each ring being provided with blocking means for blocking the relative movement of opposed rings in axial direction;

one couple of opposed rings being provided with releasing means for releasing one ring of said couple from the other ring thereof at a predetermined angular position to allow said relative movement blocked by said blocking means; and

a driving means for applying rotating force to one of said opposed rings of said couple at an urgent time such as upon an impact of said vehicle.

4,427,217

SKI ASSEMBLY WITH CARRIER

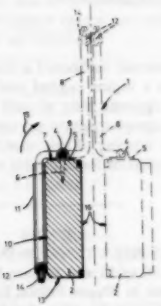
Bertrand Sauzay, 25 quai Tilsitt, Lyon (Rhone), France

Filed Jun. 29, 1981, Ser. No. 278,428

Claims priority, application France, Jul. 4, 1980, 80 15316

Int. Cl.³ A63C *11/02*

U.S. Cl. 280—814 **8 Claims**



1. A ski assembly enabling individual carrying of a single ski or the carrying of a pair of skis by one hand of a user, said assembly comprising:

a ski having an upper surface provided with a binding and having a center of gravity;

a carrying handle; and

means on said surface and forming part of the ski during skiing use thereof for movably mounting said handle on said ski in the region of said center of gravity whereby said handle is displaceable from a retracted position wherein said handle overlies said surface and is disposed below a ski boot, and an extended position wherein said handle projects outwardly beyond a longitudinal edge of said ski to enable carrying by a user, said handle being in the form of a stirrup having a pair of shank, said mounting means including means hinging said shanks on said surface to define a pivot axis for said handle parallel to the longitudinal dimension of the ski and along an edge thereof whereby said handle can swing through about 180° between said positions.

6. A ski assembly enabling individual carrying of a single ski or the carrying of a pair of skis by one hand of a user, said assembly comprising:

a ski having an upper surface provided with a binding and having a center of gravity;

a carrying handle; and

means on said surface and forming part of the ski during skiing use thereof for movably mounting said handle on said ski in the region of said center of gravity whereby said handle is displaceable from a retracted position wherein said handle overlies said surface and is disposed below a ski boot, and an extended position wherein said handle projects outwardly beyond a longitudinal edge of said ski to enable carrying by a user, said handle having the configuration of a stirrup with two parallel shanks, said mounting means including a guide plate on said surface, said guide plate being formed with guide channels respectively receiving said shanks whereby said handle is displaceable between said positions in a direction perpendicular to the longitudinal axis of said ski and in a plane parallel to said surface.

4,427,218

PRESSURE CONDUIT CONNECTING DEVICE

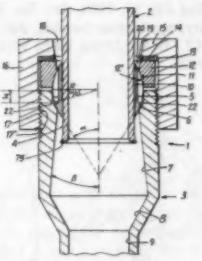
Claude Duvet, and Michel Iato, both of Pau, France, assignors to Societe Nationale Elf Aquitaine (Production), Courbevoie, France

Filed Feb. 18, 1981, Ser. No. 235,596

Claims priority, application France, Feb. 22, 1980, 80 03941

Int. Cl.³ F16L *27/04*

U.S. Cl. 285—184 **12 Claims**



1. A connecting device for connecting to each other respective ends of a first conduit and a second conduit, the connecting device comprising:

a tubular cylindrical male connecting piece fixed to the end of said first conduit, said male connecting piece having an outer periphery,

a tubular female connecting piece fixed to the end of said second conduit and having an open end facing toward said first conduit, said female connecting piece comprising, in succession, starting from the open end of said female connecting piece, a first annular portion, a convergent frustoconical annular portion, and a divergent frustoconical annular portion,

a ring member having an outer spherical periphery adapted to engage a seat constituted by said convergent annular portion, the outer diameter of said spherical periphery being slightly smaller than the inner diameter of said first annular portion of the female connecting piece, said ring member having an internal periphery, the outer spherical periphery of said ring member having a plurality of radial longitudinal grooves extending over a major portion of the ring member between a plane perpendicular to the axis of said ring member and passing through said ring member, and the end thereof which faces toward the first conduit, said longitudinal grooves each having a bottom constituted by substantially identical surfaces coaxial to the internal periphery of said ring member,

said external spherical periphery of said ring member having a narrow annular groove centered on a plane which delimits said radial longitudinal grooves in the direction of said female connecting piece,

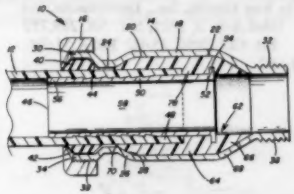
means for compressing said ring member radially in response to a longitudinal force substantially parallel to the axis of said ring member in the direction from said first conduit toward said second conduit, and

cooperating means on at least one of the internal periphery of said ring member and the outer periphery of said male connecting piece for fixing said ring member to said male connecting piece by plastic deformation of at least one of said peripheries.

4,427,219
COMPRESSION COUPLING

Edward A. Madej, Verona, Pa., assignor to Robroy Industries, Verona, Pa.

Filed Jan. 26, 1981, Ser. No. 230,116
Int. Cl.³ F16L 33/22
U.S. Cl. 285—249 16 Claims



1. A compression-type coupling for connection to a conduit comprising,

a fitting having a body portion with a bore extending therethrough,

said fitting body portion having a first tapered portion and a second tapered portion spaced axially from said first tapered portion,

said first tapered portion forming an internal shoulder of said body portion surrounding said bore and said second tapered portion forming a restraining means,

a sleeve positioned in said fitting bore, said sleeve including a body portion having a first end portion and a second end portion, said sleeve having a bore adapted to receive the conduit,

a reinforcing insert positioned in said sleeve, said reinforcing insert and said sleeve positioned together as a unit in said fitting bore,

said reinforcing insert including a tubular body portion having a diameter to facilitate insertion of said reinforcing insert in the conduit, said reinforcing insert including first and second end portions and a passageway extending therethrough,

said reinforcing insert forming an annular space between said reinforcing insert and said sleeve,

abutment means positioned on said reinforcing insert first end portion for engaging said insert to said sleeve first end portion,

said sleeve including an internal shoulder positioned in surrounding relation with said insert first end portion so that said abutment means extends into said sleeve body portion to securely engage said insert to said sleeve, said sleeve internal shoulder forming a stop for receiving the conduit extending into said annular space between said sleeve and said reinforcing insert,

said sleeve second end portion being positioned adjacent said fitting internal shoulder,

said reinforcing insert and said sleeve being restrained for limited axial movement within said fitting between said fitting internal shoulder and said fitting restraining means upon movement of the conduit into said annular space between said sleeve and said reinforcing insert,

gripping means extending between said reinforcing insert tubular body portion and the conduit positioned in said annular space for frictionally engaging the conduit to said reinforcing insert,

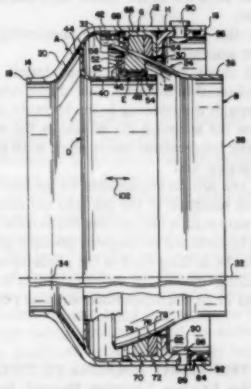
said sleeve second end portion being urged against said fitting shoulder by the force of said reinforcing insert first end portion applied to said sleeve internal shoulder when a pullout force is applied to the conduit in a direction tending to pull the conduit out of said fitting, and

said fitting internal shoulder applying upon said sleeve a compressive force which is transmitted through said sleeve body portion and said sleeve internal shoulder to the conduit to urge the conduit into increased frictional engagement with said insert to retain said insert in said fitting and prevent pullout of the conduit from said fitting.

4,427,220
FLEXIBLE JOINT FOR CONDUIT

Maurice S. Decker, Columbus, Ohio, assignor to Midland-Ross Corporation, Cleveland, Ohio

Filed Mar. 16, 1981, Ser. No. 244,146
Int. Cl.³ F16L 27/04
U.S. Cl. 285—263 27 Claims

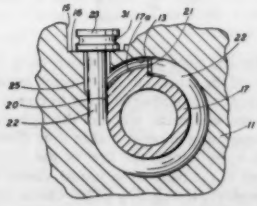


1. A flexible joint for conduit comprising: inner and outer conduit parts, said inner conduit part having a generally spherically curved end portion received in said outer conduit part and having inner and outer spherically curved surfaces, inner and outer ring assemblies including inner and outer radially opposed rings of low friction material engaging said inner and outer surfaces, and preloading means for axially preloading said joint and holding said inner and outer rings against said inner and outer surfaces with a predetermined preloading force, said preloading means including generally axially yieldable spring means which cooperate with said outer conduit part to hold said spring means in place, said inner ring assembly being carried by said spring means.

4,427,221
DRILL BIT NOZZLE RETENTION AND ALIGNMENT SYSTEM

William Shay, Jr., Wharton, Tex., assignor to Reed Rock Bit Company, Houston, Tex.

Filed Oct. 13, 1981, Ser. No. 310,574
Int. Cl.³ F16L 37/14
U.S. Cl. 285—305 7 Claims



1. A nozzle retention and alignment system for a rotary drill bit of the type adapted to direct drilling fluid under pressure in a predetermined direction against the formation to be drilled,

the bit comprising a body having a nozzle bore therein of generally circular section, and a jet nozzle having a generally cylindrical portion adapted to be fitted in the nozzle bore, the nozzle having passaging therein for directing the drilling fluid to exit the nozzle in a stream at an angle to the central longitudinal axis of the nozzle; the retention system comprising:

a groove in the cylindrical portion of the nozzle extending at least partially therearound;

a groove in the interior surface of the nozzle bore extending at least partially therearound, said grooves cooperating to form a generally annular recess in the nozzle and nozzle bore when the nozzle is in the nozzle bore and the grooves are in register;

an opening in the bit body in communication with the groove in the nozzle bore;

a pin having a shank of predetermined length formed of plastically deformable material, said shank being adapted to extend through the opening in the bit body and into the annular recess for securing the nozzle in the nozzle bore against relative longitudinal movement, with the grooves therein in register; and

stop means on the nozzle engageable by an end of the pin, whereby upon insertion of the pin into the recess, the pin engages the stop means and rotates the nozzle in the nozzle bore to a predetermined angular position in which the nozzle directs the drilling fluid in the predetermined direction and locking means for holding the nozzle against rotation when in its predetermined angular position.

4,427,222

DEVICE FOR THE TIGHT JOINING OF TWO PARTS

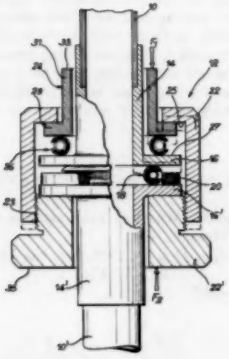
Claude Abbes, Saint Etienne; Christian Rouaud; Robert Piednoir, both of Bourg Saint Andeol, and Raymond De Villepoix, Donzere, all of France, assignors to Commissariat a l'Energie Atomique, Paris, France

Filed Jan. 12, 1982, Ser. No. 338,992

Claims priority, application France, Jan. 23, 1981, 81 01250

Int. Cl.³ F16L *19/00, 23/00, 35/00*

U.S. Cl. 285—353 **8 Claims**



1. A device for the tight joining of two parts comprising tightening means of the screw-nut type, which move the parts to be joined towards one another in order to compress at least one gasket between said parts, wherein the tightening means act on a stack comprising in order and in axial direction, relative to the parts to be joined, the first of the said parts, the gasket, the second of the parts to be joined, elastic means and a compression member, the rigidity of the elastic means being greater than that of the gasket, and abutment means being provided between said first and second parts to be joined to limit deformation of said gasket to a given value, in such a way that said stack can be tightened with the aid of auxiliary compression means prior to fitting of the tightening means, said elastic means compensating tensioning of the tightening means during slackening of the auxiliary compression means.

4,427,223

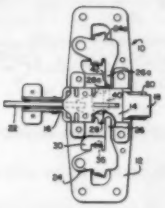
LATCHING DEVICE

Maksimilijan Godec; John R. Foster; Paul J. Straub, all of Indianapolis, and Allan K. Mahler, Terre Haute, all of Ind., assignors to Von Duprin, Inc., Indianapolis, Ind.

Filed Aug. 3, 1981, Ser. No. 289,757

Int. Cl.³ E05C *15/02;* **E05B** *55/04*

U.S. Cl. 292—92 **12 Claims**



1. A latching device, comprising:

a chassis;

a housing, having an axis, coupled to said chassis;

a latching assembly, having a latch, coupled to and movable axially of said housing (a) for retracting said latch inwardly, i.e. toward said housing, upon movement of said assembly in a first, axial direction, and (b) for extending said latch outwardly, i.e. away from said housing, upon assembly movement in a second, opposite, axial direction;

said assembly having wing means extending therefrom for engagement thereof by other means to cause axial movement of said latching assembly;

limb means pivotably coupled to said chassis, and engageable with said wing means to cause axial movement of said latching assembly;

tumbler means coupled to said chassis for movement relative to said chassis, to first and second dispositions, for prohibiting operating engagement of said limb means with said wing means, upon said tumbler means being in one of said first and second dispositions; and

camming means coupled to said chassis for movement relative thereto for moving said tumbler means from either one of said first and second dispositions to the other thereof; wherein

said wing means extends from said latching assembly into immediate adjacency to said chassis;

said limb means comprises a limb pivotably coupled to said chassis for sluing movement thereof into operating engagement with said wing means; and

said tumbler means comprises means for obstructing said limb and preventing sluing movement thereof.

4,427,224

LATCH BOLT ASSEMBLY WITH SELECTIVELY ADJUSTABLE SPINDLE BACKSET

Gary R. Bergen, Yorba Linda, Calif., assignor to Emhart Industries, Inc., Farmington, Conn.

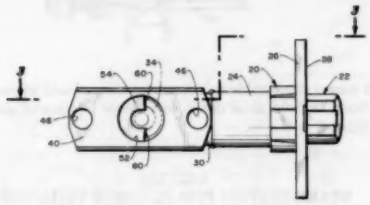
Filed Oct. 29, 1980, Ser. No. 202,254

Int. Cl.³ E05C *1//16*

U.S. Cl. 292—169.23 **20 Claims**

1. In a latch construction for mounting in doors and the like of the general type having a bolt longitudinally reciprocal in a door-mounted casing between a forward extended position projecting from a door edge and a rearward retracted position substantially fully within the door edge, latch operating means on said casing longitudinally forwardly operably connected to said bolt and longitudinally rearwardly operably connected to

an operator thereof, said operating means operator being movable about a transverse axis actuating said operating means to reciprocate said bolt, the longitudinal distance between forward extremities of said casing and said operator axis constituting backset; the improvements comprising: longitudinally rearward operator engagement means on said latch operating means operably connected to said operator when said operator is in a rearward backset position for reciprocating said bolt upon movement of said operator; selectively removable insert



means positionable adjacent and connected to said latch operating means extending longitudinally forward of said rearward operator engagement means; longitudinally forward operator engagement means on said insert means spaced longitudinally forwardly of said rearward operator engagement means operably connected to said operator when said operator is in a forward backset position for reciprocating said bolt by transferring motion from said operator upon movement thereof through said insert means into said latch operating means and through said latch operating means to said bolt.

4,427,225

BUMPER FOR MOTOR VEHICLES

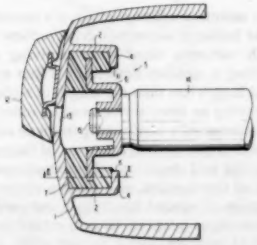
Wilhelm Bauer; Fritz Häberle, and Daniel Riechers, all of Sindelfingen, Fed. Rep. of Germany, assignors to Daimler-Benz Aktiengesellschaft, Stuttgart, Fed. Rep. of Germany

Filed Sep. 18, 1981, Ser. No. 303,526

Claims priority, application Fed. Rep. of Germany, Sep. 18, 1980, 3035164

Int. Cl.³ B60R *19/06*

U.S. Cl. 293—132 **10 Claims**



1. A bumper for motor vehicles, the bumper comprising a basic bumper element having a retaining rail means provided thereon for accepting a bumper mounting plate, wherein elastomeric means is provided for mounting the bumper mounting plate in the retaining rails means, the elastomeric means is provided with projection means for seating the elastomeric means in the retaining rails means, and means are provided in the retaining rail means for accommodating the projection means in a supporting fashion when the bumper is in an installed position.

4,427,226

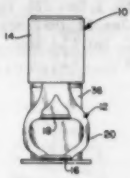
PLASTIC LENS INSERTION AND REMOVAL DEVICE

Ewart E. Shartzer, 1150 Riverside Dr., Akron, Ohio 44310

Filed Apr. 22, 1982, Ser. No. 370,728

Int. Cl.³ A61F *9/06*

U.S. Cl. 294—1 CA **8 Claims**



1. Apparatus for positioning or removing a plastic lens into or from a person's eye comprising:

the combination of an eyelid opener including a handle and upper and lower crossbars adapted to be individually engaged with a persons's upper and lower eyelids respectively and retain them open; and

a plastic lens engaging tweezer that has a pair of arms with a flexible lens engaging means extending between the free ends of the tweezer arms and controlled by the arms for engaging or releasing the plastic lens, said handle being positioned by one hand below the persons eye, and said tweezer being positioned and controlled by the persons other hand and being substantially horizontal to extend between said cross bars to position a plastic lens on the persons eyeball.

4,427,227

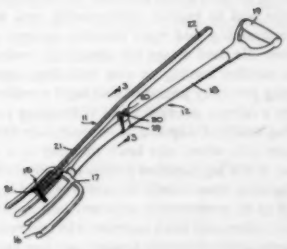
APPARATUS FOR PICKING UP LAMINAR ITEMS

John J. Haskell, P.O. Box 125, Kent, Conn. 06757

Filed Jun. 21, 1982, Ser. No. 390,559

Int. Cl.³ A01B *1/18*

U.S. Cl. 294—50.9 **7 Claims**



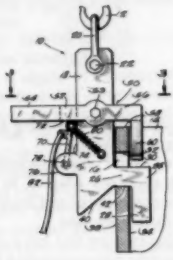
1. Apparatus for picking up laminar items from a randomly strewn pile of such items, the apparatus including a forked implement having an elongated shaft, a plurality of spaced times extending generally in the longitudinal direction of the shaft, the tines being almost straight with no abrupt change in curvature, and a transverse hand grip at the other end of the shaft, wherein the improvement comprises:

a lever shorter than said shaft and having a pivot location intermediate its ends and

means for pivotally connecting the lever in spaced relation to the shaft at said pivot location such that one end of the lever moves toward the tines when the other end of the lever is moved away from the other end of the shaft, said one end of the lever including a cross member extending transversely to the tines of the forked implement for clamping laminar items against said tines, the cross member comprising a flat bar having an edge extending per-

pendicularly to the tines and adapted to contact the opposed faces of at least two tines when the other end of the lever is moved away from the other end of the shaft.

4,427,228
SHEET PILE HOIST DEVICE
Earl H. Mattila, Rte. 1, Box 324, Trimountain, Mich. 49966
Filed Jan. 11, 1982, Ser. No. 338,783
Int. Cl.³ B66C *1/36*
U.S. Cl. 294—83 R **6 Claims**



1. An apparatus adapted to be connected to a hoisting cable and for lifting and carrying a sheet pile including a metal plate having an upper end and an opening adjacent said upper end, said apparatus including a rigid member having opposite ends, an upper end adapted to be joined to the hoisting cable and a lower end having a surface portion adapted to be positioned adjacent one side of the metal plate, a jig member projecting from said surface portion of said lower end of said rigid member, said jig member being adapted to extend through said opening, said jig member including a first leg portion extending transversely to said surface portion and including one end fixed to said surface portion and a free end adapted to extend through said opening, and a second leg portion extending transversely from said free end of said first leg portion and adapted to be positioned adjacent to the opposite side of said sheet pile and to extend downwardly, and means for selectively restraining said rigid member against said one side of said sheet pile, said means for selectively restraining including a latch member having an arm including opposite ends, said arm being pivotally joined to said rigid member for mvoement between a release position and a restraining position, said arm including one end adpated to extend over said upper end of said sheet pile when said latch member is in said restraining position, and a leg member joined to said one end of said arm and extending transversely to said arm, said leg member being adapted to be positionable adjacent said opposite side of said sheet pile when said latch member is in said restraining position and to extend downwardly toward said free end of said first leg portion and means for supporting said latch member such that said latch member will tend to pivot to said release position.

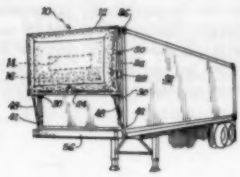
4,427,229
STREAMLINING APPARATUS
David W. Johnson, 1884 Sunset Blvd., San Diego, Calif. 92103
Filed Jan. 8, 1982, Ser. No. 337,809
Int. Cl.³ B62D *35/00*
U.S. Cl. 296—1 S **15 Claims**

13. An apparatus for streamlining the bluff front of a trailerized shipping container having two upper front corners, said apparatus comprising:

(a) engaging means comprising a pair of poles each having a hook mounted on an upper end thereof for engaging said front corners;

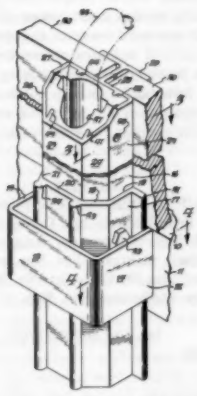
(b) a pair of pulleys mounted to said engaging means;

(c) means engageable to the upper portion of a streamlining body for hauling same up against said bluff front by use of said pulleys; and,



(d) means engageable to a lower portion of said streamlining body to hold same down to a lower portion of said bluff front.

4,427,230
STAKE SYSTEM FOR FLATBED VEHICLES
Sam Avny, 44 Holmes Pl., Fredonia, N.Y. 14063
Filed Oct. 13, 1981, Ser. No. 310,477
Int. Cl.³ B60P *7/06*
U.S. Cl. 296—43 **11 Claims**



9. In a stake assembly wherein a sleeve is provided to permit the use of stake bodies of a common cross section with vehicles provided with variously sized stake-receiving pockets; said sleeve comprising a member defined by a thin wall section of predetermined length less than the length of a stake body, said wall section having an inner surface and an outer surface, said inner surface substantially conforming in shape and dimensions to the shape and dimensions of a portion of the exterior of the stake body so that said sleeve closely contacts said stake body when it is placed thereagainst, said outer surface of said sleeve having a plurality of spaced apart rigid outwardly vertically extending projections adapted to non-rotatably contact the sidewalls of said stake-receiving pocket when said sleeve is placed therein.

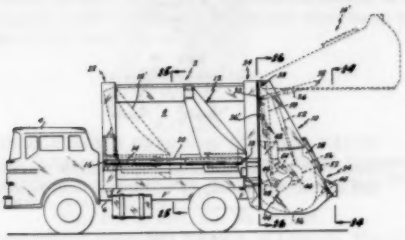
4,427,231
REFUSE COMPACTION APPARATUS
Fred T. Smith, Palos Verdes, Calif., assignor to Sargent Industries, Inc., Los Angeles, Calif.
Division of Ser. No. 876,644, Feb. 10, 1978, abandoned. This application Feb. 23, 1981, Ser. No. 237,364
Int. Cl.³ B62D *39/00*
U.S. Cl. 296—183 **15 Claims**

1. A refuse compaction apparatus including a container for

storing refuse, a tailgate mounted on the container for pivotal movement between an opened and a closed position, the tailgate in its opened position providing for refuse to be discharged from the container and the tailgate in its closed position forming a closure with the storage container, the improvement comprising:

a keeper attached to the container,

a latch disposed on the keeper and engageable with the keeper with the tailgate in its closed position,



means to provide rotational movement of the latch with the tailgate into a position relative to the container to provide for a latching relationship with the keeper, and

means responsive to a disposition of the latch for a latching relationship with the keeper to provide a translational movement of the latch into contact with the keeper to maintain the tailgate in a closed position relative to the storage container.

4,427,232

REVERSIBLE CHAIR-DESK CONSTRUCTION

Richard K. Maim, Rte. 2, Maple Park, Ill. 60151

Filed Feb. 27, 1981, Ser. No. 238,759

Int. Cl.³ A47B *83/02*

U.S. Cl. 297—161 **8 Claims**

1. A reversible chair-desk construction for use by left and right handed persons with equal facility comprising:

a chair having a generally horizontal seat having a front, a rear, and right and left sides, with a vertically extending back at the rear of the seat and means for supporting the seat in an elevated position above an underlying floor or the like;

a generally L-shaped tablet arm terminating at one end in an enlarged tablet having two opposed sides each defining a writing surface;

means pivotally interconnecting the other end of said arm to the back of said chair generally medially of the center thereof to define a substantially horizontal pivot axis for said arm so that said arm may by swung to either the left or right side of said seat; and

means for supporting said arm in a generally horizontal position on either said left or right side of said seat;

whereby said arm may be selectively disposed to either side of said chair for use of one or the other of said writing surfaces by a right or left handed person as appropriate.

4,427,233

SUPPORT MEANS FOR STAYS OF A CAR HEAD REST

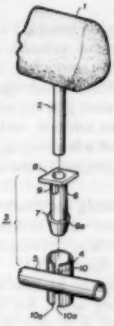
Hiroki Matumoto, Yokohama, Japan, assignor to Ikeda Bussan Co., Ltd., Kanagawa, Japan

Filed Jun. 24, 1981, Ser. No. 276,951

Claims priority, application Japan, Jul. 10, 1980, 55-97217[U]

Int. Cl.³ A47C *1/02*

U.S. Cl. 297—391 **2 Claims**



1. Support means for stays of a car head rest comprising a sleeve secured to a seat back frame; a stay guide member having a resilient jaw provided at its lower end and a flange provided at its upper end and extending through said sleeve with said jaw and said flange engageable with the lower and upper ends of said sleeve respectively, each of said stays of said car head rest being removably inserted into said stay guide member, said stay guide member having a stopper engaged with said sleeve so that said stay guide member is prevented from rotation about said sleeve, characterized in that said sleeve has an axial slit extending throughout the length of said sleeve, and said stopper of said stay guide member engaging said axial slit in said sleeve.

4,427,234

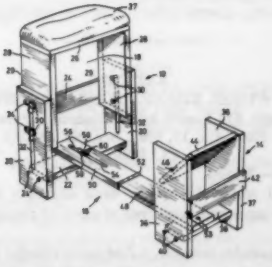
LEG REST

Douglas A. Peters, 4 Grandor Ct., West Hill, Ontario, Canada M1E 1E1

Filed Apr. 7, 1981, Ser. No. 251,898

Int. Cl.³ A47C *9/12*

U.S. Cl. 297—439 **6 Claims**



1. A leg rest comprising a first support adapted to fit under the knees of a person seated in a chair, a second, lower support adapted to receive the feet of said person, a spacer extending

between the supports and detachable therefrom having means for adjusting the spacing between the supports, and means within the first support for storing the second support therein.

4,427,235

METHOD OF SOLUTION MINING SUBSURFACE OREBODIES TO REDUCE RESTORATION ACTIVITIES

George J. Hartman, Casper, Wyo., assignor to Ogle Petroleum Inc. of California, Casper, Wyo.

Filed Jan. 19, 1981, Ser. No. 226,122
Int. Cl.³ E21B *43/28*
U.S. Cl. 299—5 **6 Claims**

1. A method of solution mining for the insitu extraction of ore located in an aqueous subsurface environment wherein partial restoration of the subsurface environment takes place during mining, said method comprising the steps of:

(a) introducing a lixiviant into the subsurface environment to produce a pregnant solution, said lixiviant comprising an oxidizing agent and a leaching agent;

(b) recovering the pregnant solution from the subsurface environment;

(c) substantially reducing the concentration of the oxidizing agent in the lixiviant while continuing to introduce lixiviant into the subsurface environment and to recover the pregnant solution therefrom;

(d) further continuing the introduction of the lixiviant containing the leaching agent for an interval sufficient to effect a substantial reduction in concentration of substances affected by the presence of the oxidant in said lixiviant; and

(e) terminating the introduction of the lixiviant into the subsurface environment.

4,427,236

IN-SITU URANIUM LEACHING

Billy J. Dotson, Grand Prairie, Tex., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Aug. 18, 1981, Ser. No. 293,785
Int. Cl.³ E21B *43/28*; E21C *41/14*
U.S. Cl. 299—5 **12 Claims**

1. An improved process for the recovery of mineral values from a subterranean deposit, having heterogeneous permeability zones, penetrated by injection and production systems, comprising:

a. introducing into said deposit via said injection system a lixiviant containing a leaching agent, foaming agent, and dissolved gaseous oxidant;

b. displacing said lixiviant through said subterranean deposit to solubilize mineral values therein;

c. producing pregnant lixiviant containing mineral values from said production system; and

d. recovering mineral values from said pregnant lixiviant.

4,427,237

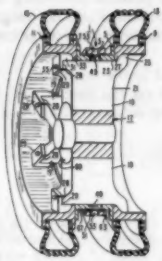
DUAL WHEEL RIM SPACER BAND ASSEMBLY

William Beegle, 611 Fourth Ave. Lakemont, Altoona, Pa. 16602

Filed Apr. 19, 1982, Ser. No. 369,801
Int. Cl.³ B60B *11/02*
U.S. Cl. 301—13 SM **10 Claims**

1. A dual wheel rim spacer band assembly for insertion between the inner and outer rims of a pair of rim mounted tires comprising:

a central annular member; a first outer annular member and a second outer annular member, each of said outer annular members being adjustably interconnected with said central annular member to effect the axial displacement thereof relative to said central annular member with said first and second outer annular members each bearing axially against one of said rims, whereby said inner and



outer rims are maintained in a determinable spaced-apart and aligned relationship by said spacer band assembly.

4,427,238

VEHICLE WHEEL TRIM

James Connell, 5017 Dianna Dr., Bloomfield Hills, Mich. 48013

Division of Ser. No. 86,004, Oct. 17, 1979, Pat. No. 4,328,997.
This application Jun. 5, 1981, Ser. No. 270,941
Int. Cl.³ B60B *7/06*
U.S. Cl. 301—37 P **4 Claims**

1. In a unitary molded annular trim means of form-sustaining material for providing an ornamental trim for the axially outer face of a vehicle wheel having an annular tire-supporting flange, the combination of means for concealing the radial outer peripheral portion of said wheel comprising an annular radial flange, means for concealing the radially inner surface of said tire-supporting flange and for fitting co-axially within and closely thereto comprising an annular axial flange, said radial and axial annular flanges comprising portions of said unitary molded annular trim means, the radially inner periphery of said annular radial flange terminating at a juncture with the axially outer periphery of said annular axial flange, said axial flange terminating axially outwardly at said juncture, a plurality of radially shallow and circumferentially spaced clip-securing recesses associated with said axial flange and opening axially inwardly, a plurality of thin sheet spring steel retention clips associated with said recesses respectively, each clip comprising a radially thin axial extension secured within the associated recess and extending axially inwardly from the opening of the associated recess, said annular axial flange having radially spaced inner and outer surfaces, the radial dimension of each clip-securing recess being less than the radial spacing between said inner and outer surfaces, a separate boss of said unitary molded flange means associated with each recess, each boss extending radially outwardly from the radially outer surface of said axial flange at the region of the associated recess and comprising the radially outer wall of the associated recess, said axial flange comprising the radially inner wall of each recess, each boss having a radial thickness on the order of magnitude of the radial spacing between said inner and outer surfaces and merging axially outwardly at a shallow angle with said outer

surface of said axial flange, each boss also extending axially inwardly to the axially inner periphery of said annular axial flange and defining a radial enlargement of said axially inner periphery, each recess opening axially inwardly from said axially inner periphery at the region of the associated enlargment, the thin axial entension of the retention clip associated with each recess extending axially inwardly from the associated enlargement at said axially inner periphery, then radially and axially outwardly in a reverse bend around the associated enlargement to effect a retaining extension terminating at a free-standing end for resiliently engaging said wheel flange to secure said trim means to said wheel.

4,427,239

DUAL-CIRCUIT PRESSURE CONTROL VALVE

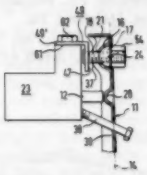
Hans D. Reinartz, Frankfurt am Main, and Bernd Schopper, Hattersheim, both of Fed. Rep. of Germany, assignors to ITT Industries, Inc., New York, N.Y.

Filed Feb. 5, 1981, Ser. No. 231,706

Claims priority, application Fed. Rep. of Germany, Mar. 11, 1980, 3009288

Int. Cl.³ B60T *8/02, 8/18*

U.S. Cl. 303—22 R **21 Claims**



1. A dual-circuit pressure control valve to control pressure in each circuit of a hydraulic dual-circuit brake system for automotive vehicles comprising:

a common control lever having a longitudinal axis, said control lever being subjected to a control force and acting upon a pair of control valve actuating tappets extending out of one surface of a housing, each of said pair of actuating tappets controlling pressure in a different one of said brake circuits;

support means to support said control lever at said housing tiltable around said longitudinal axis and a transverse axis perpendicular to the longitudinal axes of said pair of actuating tappets and said longitudinal axis; and

stop means disposed between said control lever and said housing to limit tilting of said control lever around said longitudinal axis without inhibiting tilting of said control lever around said transverse axis, said stop means including a housing stop surface adjacent said one surface of said housing, and a pair of circular stop surfaces each extending from said control lever on opposite sides of, parallel to and spaced from said longitudinal axis toward said one surface of said housing adjacent said housing stop surface, a central point of each of said pair of circular stop surfaces being disposed in a plane parallel to the longitudinal axes of said pair of actuating tappets containing said transverse axis, said pair of circular stop surface and said housing stop surface being spaced a predetermined distance from each other such that, upon failure of one of said brake circuits, that one of said pair of circular stop surface associated with that one of said pair of actuating tappets associated with the other of said brake circuits engages said housing stop surface after only a slight inward movement of the other of said pair of actuating tappets associated with said one of said brake circuits.

4,427,240

ENDLESS LINEAR BALL BEARING

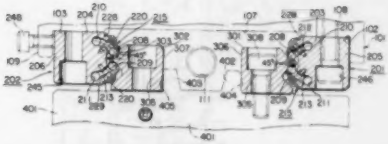
Hiroshi Teramachi, 34-8 Higashi-Tamagawa, 2-chome, Setagaya-ku, Tokyo, Japan 158

Filed Jan. 25, 1983, Ser. No. 460,949

Claims priority, application Japan, Feb. 13, 1982, 57-21835; Jul. 21, 1982, 57-109494[U]

Int. Cl.³ F16C *29/06*

U.S. Cl. 308—6 C **3 Claims**



1. An endless ball bearing arrangement for relative longitudinal movement between a table having a longitudinal edge portion and a longitudinal side portion alongside said table, one of said portions being movable with respect to the other portion, said arrangement comprising in combination:

(a) a pair of elongated straight metal block bearing bodies (**203, 204**) each having a flat top and a flat bottom, said bearing bodies also having a back part, said bearing bodies being located in one of said longitudinal portions facing the opposite longitudinal portions;

(b) said metal block bearing bodies also having a front part of W-shape cross-section, said W-shape laying on one side, said W-shape having outer arms extending towards said top and bottom parts, a center pointing towards the back and a junction of said outer arms and said center;

(c) a pair of bearing first races (**208, 209**), in said bearing bodies (**203, 204**) extending parallel longitudinally at said junction on both sides of said center, across the length of said bearing bodies, said first races serving as the races for loaded balls, the radius of curvature of the races being only slightly greater than one-half the diameter of balls which are to be loaded therein, said first races being inclined at an angle of about 45° to the horizontal towards said W-shape center, second races for unloaded balls parallel to said first races disposed away from said first races in said bearing bodies;

(d) a retainer (**215**) of W-shape sized to fit over the W-shaped front part with parallel slits (**218, 219**) disposed over the races, the width of the slits being slightly smaller than the diameter of the balls to be used, tongues (**235**) for scooping up balls (**207**) formed at opposite ends of the slits;

(e) end plates (**230, 231**) with U-shaped turning grooves (**232, 233**) for guiding balls; and,

(f) race bars (**301, 302**) with bearing third races (**303, 304**) corresponding to the first races (**208, 209**) disposed opposite the retainer slits (**218, 219**) in the other of said table portions.

4,427,241

COMPOSITE BEARING RACES AND PROCESS FOR PRODUCING THE SAME

Chester F. Jatczak, Canton, Ohio, assignor to The Timken Company, Canton, Ohio

Filed Jan. 18, 1982, Ser. No. 340,264

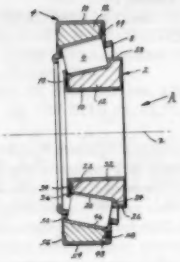
Int. Cl.³ F16C *33/00, 33/58*

U.S. Cl. 308—207 R **9 Claims**

1. A race for an antifriction bearing, said race comprising:

(a) a sheet metal shell form comprising two pieces of ferrous alloy material in which one piece has a cylindrical wall with one edge turned to form a flange and the other piece has a conically shaped wall forming a raceway surface with large diameter and small diameter ends, said other piece being formed with a turned edge to form a flange at

that edge, the two pieces being joined together at said turned edges with said flanges in fixed abutment such that said cylindrical wall and conically shaped wall are spaced apart to provide a cavity therebetween which is closed at one side by said abutted flanges; and



(b) a core located within the cavity of the shell form to rigidify the shell form, the core being a ferrous alloy that is different from the alloy of the shell form and being bonded to the spaced apart walls and the end wall of the shell form.

4,427,242

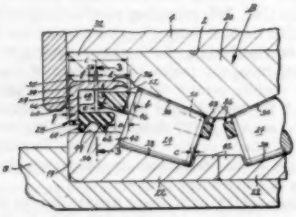
UNITIZED TAPERED ROLLER BEARING

Dennis L. Otto, Malvern, Ohio, assignor to Atlantic Richfield Company, Los Angeles, Calif.

Filed Jan. 26, 1982, Ser. No. 342,826

Int. Cl.³ F16C *33/72, 33/36*

U.S. Cl. 308—187.2 **7 Claims**



1. An antifriction bearing arrangement comprising:

(a) an outer race having an inwardly presented raceway;

(b) a row of rolling elements along the raceway of the outer race, said rolling elements being tapered between large diameter and small diameter ends;

(c) an inner race having an outwardly presented raceway along which the rolling elements likewise extend, the inner race being configured adjacent its ends with a thrust rib and a retaining rib embracing the large and small diameter ends respectively of the rolling elements at substantially right angles such, if moved in one axial direction with respect to the outer race, it will cause the rolling elements to seat firmly against the inner and outer raceways, and if moved in the opposite axial direction the retaining rib will force the rolling elements in the direction that it is moved;

(d) a cage formed of a plastic material positioned between the outer and inner races, the cage being configured to maintain the rolling elements in spaced positions, and the cage having an end ring that projects beyond the large diameter ends of the row of rolling elements in said opposite axial direction;

(e) abutment means disposed in the bearing arrangement in fixed position opposed to the end ring of said plastic cage and spaced from the end ring with an operating clearance, such that the inner race, if moved far enough in said opposite direction, will move the retaining rib and rolling elements in an axial direction and cause the cage end ring to take-up the operating clearance and bear against the abutment; and

(f) a seal case providing a confining surface mounted in a fixed position with respect to the outer race and surrounding the end ring of the cage, the seal case supporting the abutment means in the fixed position with its confining surface spaced from the plastic end ring for establishing an operating clearance between the end ring and the confining surface such that the latter surface will confine the end ring when the end ring is forced against the abutment and thereby prevent the cage from buckling significantly.

4,427,243

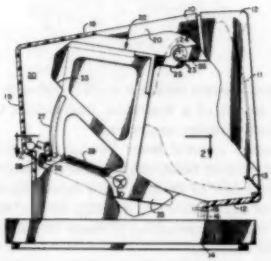
DISPLAY STATION TILT MECHANISM

Robert J. Miller, Salford, Pa., assignor to Decision Data Computer Corporation, Horsham, Pa.

Filed Jul. 28, 1981, Ser. No. 287,650

Int. Cl.³ A47B *81/06*

U.S. Cl. 312—7.2 **9 Claims**



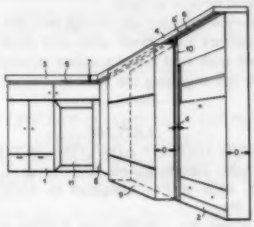
1. A tilt mechanism for counter balanced tilting of a viewing screen of a console on which information is electronically displayed, said console having a planar base, hinge means for hinging the viewing screen to the planar base for tilting the screen from a substantially vertical position in which the screen is substantially balanced through positions of progressively increased tilt at which the screen becomes progressively more unbalanced to a maximum tilt position, a tilt control bracket extending rearwardly from the viewing screen in a plane extending perpendicularly to the hinge axis, means pivotally mounting said bracket to the screen for pivotal movement of the bracket relative to the screen in said perpendicularly extending plane, said bracket having a camming surface located rearwardly of said pivotal mounting means in a plane perpendicular to the hinge axis, an abutment fixed relatively to the base extending into the plane and spring means elastically deformable upon movement of the screen towards the maximum tilt position for urging said camming surface into engagement with said abutment, the spring means being mounted to provide for minimum exertion of spring force when the screen is in a substantially vertical position and to provide gradually increasing spring force as the screen is moved toward a position of maximum tilt.

4,427,244

SLIDING WALL-UNIT FURNITURE ASSEMBLY

Erna Castagna, Knödelhüttenstr. 35, 1140 Wien, Austria

Filed Mar. 3, 1981, Ser. No. 240,243
Claims priority, application Austria, Mar. 7, 1980, 1271/80
Int. Cl.³ A47B 67/02; E05D 15/58
U.S. Cl. 312—245 4 Claims



1. A wall-unit furniture assembly comprising:
a stationary wall unit having an upper edge and two portions extending at an angle to each other;
a front rail and a rear rail supported parallel to each other on said upper edge and each including a pair of straight rail sections extending at an angle to each other along the respective wall-unit portions and an arcuate corner section interconnecting the respective straight sections;
a rear sliding door having outer upright edges;
a front sliding cabinet having outer upright edges; and
means including front and rear hardware respectively pivotal about respective vertical axes on and hanging said front cabinet and rear door on said front and rear rails for displacement therealong independently of each other, said hardware including front and rear rollers respectively carried on said front cabinet and rear door at the respective edges and engaging said front and rear rails and supports carrying the respective rollers and pivotal on said door and cabinet at said edges about said vertical axes, said supports each carrying two such rollers spaced apart along the respective rail and flanking the respective vertical axis, said rear door being slidable between said front cabinet and said wall unit and wholly past said front cabinet, said supports each including
a mounting plate secured adjacent the respective edge,
an upright threaded spindle projecting upward from said plate and defining the respective axis,
a dolly carrying the respective rollers and formed with a vertically throughgoing hole through which said threaded spindle passes, and
at least one nut screwed onto said spindle and bearing downward on said dolly.

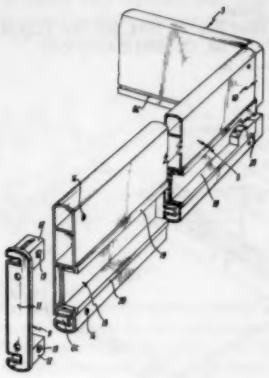
4,427,245

DRAWER PANEL WITH TRACK INSERT

Leon G. Litchfield, and Terence Hardy, both of Belper, England, assignors to L.B. (Plastics) Limited, Belper, England

Filed Jan. 8, 1981, Ser. No. 223,532
Claims priority, application United Kingdom, Jan. 11, 1980, 8000960
Int. Cl.³ A47B 88/00
U.S. Cl. 312—330 R 10 Claims

1. Drawer wall components for the production of drawers of different length or width or for mounting on different drawer runner assemblies, comprising a wall-forming panel member or uniform cross-section appropriate lengths of which are selected to form the drawer sides and back in accordance with the length and width or the drawer to be formed, and which incorporates a longitudinal recess in the face thereof which will be outermost when the drawer is assembled, and a plurality of alternatively useable inserts of elongated form adapted for engagement in said recesses in the lengths of panel member forming the drawer sides, each of said inserts incorporating integrally formed projections for cooperation with a pre-determined type runner on which the drawer is adapted to be mounted.

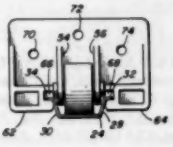


4,427,246

DRAWER GUIDE SYSTEM

Paul M. MacDonald, Scituate, Mass., assignor to Dickran Babigian, Trustee, West Newton, Mass.

Filed Aug. 28, 1981, Ser. No. 297,242
Int. Cl.³ A47B 88/04
U.S. Cl. 312—330 R 3 Claims



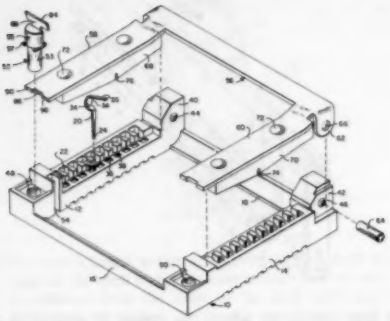
1. A system for supporting and guiding a drawer for opening and closing the same within a cabinet comprising
(a) a rail mountable to said cabinet, and,
(b) a roller bracket mountable to said drawer,
(c) said rail being formed with a longitudinal trough and a pair of outwardly extending co-planar longitudinal flanges along the sides of said rail,
(d) said bracket including a roller rotatably mounted thereto and adapted to ride along said trough,
(e) said bracket being formed with a pair of re-entrant openings, one on each side of said roller and adapted to receive said flanges when said bracket is connected to said rail,
(f) said bracket formed with a flat forward face adapted to engage the rear wall of said drawer and at least one lip perpendicular to said face extending from said face to engage a rearward edge of the bottom wall of said drawer.

4,427,247

MAGNETIC BUBBLE MEMORY SOCKET

Richard W. Petersen, Taunton, Mass., assignor to Augat Inc., Mansfield, Mass.

Filed Jun. 12, 1981, Ser. No. 273,119
Int. Cl.³ H01R 4/66, 9/09
U.S. Cl. 339—14 R 13 Claims



12. A magnetic bubble memory socket, comprising:

a base having first and second spaced-apart side members having electrical terminals mounted in spaced-apart terminal-receiving apertures provided therein, each of the terminals having a depending electrode tail adapted for insertion into a circuit board and a resilient head portion adapted to be received in anti-overstress shelves provided thereof that are individually in communication with corresponding ones of the terminal-receiving apertures;

a cover having first and second spaced-apart electrically interconnected and electrically conductive latching arms pivotally mounted to the first and second side members each having first and second resilient bumper pads fastened thereto for applying a compliant stress to a bubble memory device when the cover is in a closed condition;

electrically conductive latching means fastened to the ends of the arms for removably retaining the cover in the closed condition; and

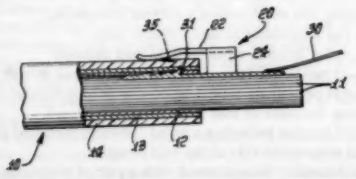
means electrically connected to the latching means for mounting the first and second spaced-apart arms to an interconnection board and for electrically grounding the latching arms to the interconnection board.

4,427,248

SPRING LOADED SHIELD BOND CONNECTOR

Donald J. Smith, Woodland Hills, Calif., assignor to Communications Technology Corporation, Los Angeles, Calif.

Filed Nov. 17, 1981, Ser. No. 322,081
Int. Cl.³ H01R 4/24, 4/66
U.S. Cl. 339—14 R 9 Claims



1. A screwless connector for making an electrical connection with the metal shield of an electrical cable having a plurality of insulated conductors, an inner metal shield over the conductors, and an outer insulating sheath over the shield,

said connector comprising a single unitary metal piece having a central section and opposed outer sections joined to said central section, with said outer sections generally parallel to and spaced upward from said central section and spaced outward on opposite sides of said central section,

said central section having a tongue carrying a plurality of teeth, with said teeth directed upward toward said outer sections,

with said outer sections having tips directed downward toward said central section,

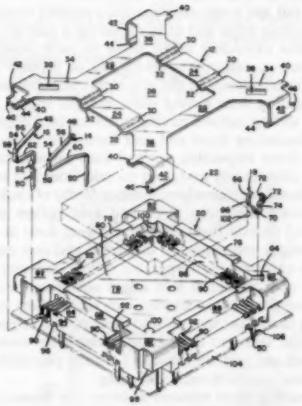
with said tongue adapted for sliding into the cable between the conductors and shield with said teeth engaging the shield and with said outer sections overlying the sheath with said tips engaging the sheath.

4,427,249

LOW HEIGHT ADS CONNECTOR

Edward J. Bright, Elizabethtown, and Steven J. Kandybowski, Tower City, both of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Continuation of Ser. No. 230,202, Feb. 2, 1981, abandoned. This application Aug. 30, 1982, Ser. No. 412,680
Int. Cl.³ H01R 23/68
U.S. Cl. 339—17 CF 4 Claims



1. A connector mountable on a printed circuit board for holding and electrically connecting an active device substrate to conductive traces on the board, the connector comprising:

a. a housing of insulating material formed in a square frame configuration and having corner blocks, side walls extending between and connected to the corner blocks and a floor, said blocks, side walls and floor defining an upwardly open, substrate-receiving compartment, the side walls having a step on the lower, outer surface providing an upwardly facing ledge, spaced openings extending through the side walls and into the central compartment and grooves extending across the ledge normal to the side walls, each groove connecting with an opening and latching means on each of the corner blocks,

b. first and second contact elements stamped and formed from a conductive material and having a C-shaped section with a contact surface at the free end of the upper limb and a depending pin at the free end of the lower limb, the lower limbs on the first elements being longer than such limbs on the second elements and further, being bent horizontally so that the pin depending therefrom is displayed horizontally with respect to the upper limb, said elements being positioned in the housing with the upper limbs positioned in the grooves on the steps of the side walls and extending through the openings so that the contact surfaces are positioned around the periphery of

the central compartment and adapted to electrically engage an active device substrate which may be placed therein, and the lower limbs extend underneath the housing with the pins depending therefrom for insertion into a printed circuit board, the first and second elements being loaded in the housing in alternating fashion so that the pin on each first element is in line with the pin on an adjacent second element; and

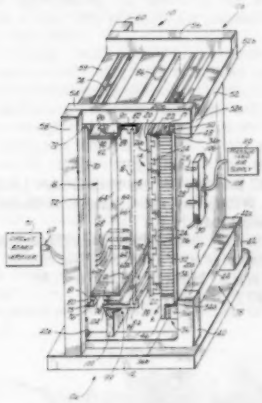
c. a cover for placement over the housing and having latching means for engaging the latching means on the corner blocks so that an active device substrate which may be placed in the central compartment will be retained therein.

4,427,250

PRINTED CIRCUIT BOARD TEST FIXTURE WITH COMPLIANT PLATEN

Clyde K. Hines, Claremont, and Lyle Fettig, La Verne, both of Calif., assignors to Everett/Charles Test Equipment, Inc., Pomona, Calif.

Filed Jan. 19, 1981, Ser. No. 226,520
Int. Cl.³ H01R *13/62*
U.S. Cl. 339—75 M **62 Claims**



1. Apparatus for making electrical contact with test points on a test member comprising:

means for mounting the test member for movement to a test location;

a plurality of conductive probe heads, each having a contact end, said contact end of each probe head lying generally in a plane that is co-planar with the location for test;

a plurality of flexible inflators mounted adjacent the test location; and

means for distending the inflators for causing each inflator to contact such test member for urging such test member to the test location and against the probe heads such that the contact points of the probe heads contact selected test ends on the test member.

4,427,251

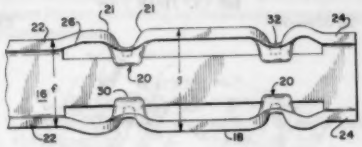
ELECTRICAL CONNECTOR HAVING DISPLACEABLE SIDEWALL TERMINAL ELEMENT

Istvan Mathe, and Alan H. Kasper, both of Cicero, Ill., assignors to Allied Corporation, Morris Township, Morris County, N.J.

Continuation-in-part of Ser. No. 788,110, Apr. 18, 1977, abandoned. This application Sep. 27, 1978, Ser. No. 946,273
Int. Cl.³ H01R *13/38*
U.S. Cl. 339—97 P **19 Claims**

1. An insulation-piercing contact mounted in a cavity of an electrical connector, comprising:

a channel including a pair of sidewalls adapted to receive an insulation covered conductor, at least one of said sidewalls including a portion displaceable from an initial position wherein the transverse dimension of said channel at said portion is greater than the transverse dimension of said cavity, to a final position wherein said sidewalls are located within and engage the lateral surfaces of said cavity; and



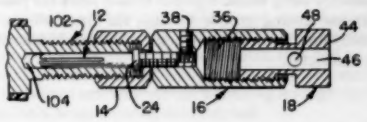
at least one pair of protuberances forming a conductor-receiving notch adapted to open and displace said insulation and make electrical connections with the conductor, one of said protuberances extending inwardly from the displaceable portion of each said sidewall.

4,427,252

ELECTRICAL CONNECTOR

Noel Lee, Daly City, and Andrew L. Choy, San Francisco, both of Calif., assignors to Monster Cable Products, Inc., San Francisco, Calif.

Filed Jun. 18, 1981, Ser. No. 274,767
Int. Cl.³ H01R *4/30*
U.S. Cl. 339—89 R **13 Claims**



1. An electrical connector for connection to a post type connector defined by an externally threaded tubular member having a smooth pin-receiving internal bore, said electrical connector comprising:

a male pin connected to the end of a connector body;

an internally threaded collar mounted on said pin for free rotation, said collar being threadedly engagable with the external threads of the post-type connector;

said connector body, at the end thereof remote from said pin, having a threaded bore therein; and

a terminal fastener having a threaded portion for threadedly engaging said threaded bore of said connector body and a head portion for securing an electrical terminal between the said head portion and the end of the connector body, said terminal fastener including an axially directed bore for receiving a pin-type banana connector and a diametrically aligned bore for receiving an electrical conductor for detachably securing the conductor between said head and the end of the connector body.

4,427,253

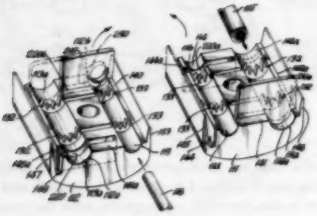
FULLY INSULATED ELECTRICAL CLAMP CONNECTOR WITH INBOARD INSULATING TAB AND SLOT

Philip L. Smith, and Joseph R. Caprio, both of Madison, Conn., assignors to Kupler Corporation, Branford, Conn.

Continuation-in-part of Ser. No. 277,991, Jun. 26, 1981. This application Dec. 1, 1981, Ser. No. 326,218

Int. Cl.³ H01R *7/04*

U.S. Cl. 339—98 **25 Claims**



1. An electrical clamp connector, comprising: first and second half portions molded of electrically insulating material and means to bolt said half portions together; each half portion having at least two lengthwise grooves therein, the grooves mating and serving to enclose conductors upon bolting of the two half portions together; electrical bridging members having piercing teethed portions; bridging member slots in the half portions generally transverse to the grooves for insertion of the bridging members, the teeth protruding from the grooves upon said insertion; means permitting pivoting of the half portions with respect to each other upon assembly to accommodate various conductor sizes while maintaining a fully insulated connector along both its sides; a tab slot for an insulating tab in at least the first half portion, the tab slot being positioned inboard and spaced from an end of the first half portion; an insulating tab in at least the second half portion, said tab being positioned inboard and spaced from an end of the second half portion; the insulating tab blocking the passage of at least one groove through the second half portion; and, said insulating tab fitting within said tab slot upon the two half portions of the connector being bolted together to also block the passage of at least one mating groove through the first half portion and thereby fully insulate a conductor end from the exterior end of the connector.

4,427,254

PRINTED WIRING CARD STIFFENER BRACKET

James V. Koppensteiner, Chicago, Ill., assignor to GTE Automatic Electric Labs. Inc., Northlake, Ill.

Filed Dec. 7, 1981, Ser. No. 328,299

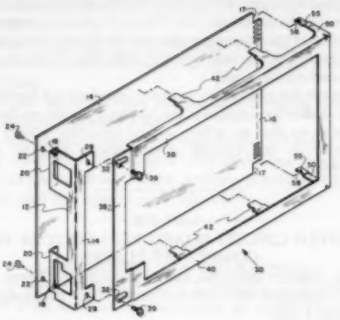
Int. Cl.³ H05K *5/00*

U.S. Cl. 339—108 R **3 Claims**

1. A printed wiring card stiffener bracket comprising:

a handle portion extending along the edge of a printed wiring card to be stiffened that is exposed when the card is inserted into a card file, said handle portion including means mounting the handle portion to the printed wiring card; and,

a stiffener portion extending along the remaining edges of the printed wiring card and including means for mounting said stiffener portion to said handle portion, said stiffener portion further including a plurality of blade arms resting on the edges of the printed wiring card that adjoin the handle portion at intervals suitable to stiffen said printed wiring card and prevent warpage and linear distortion, and a pair of corner members each including L-shaped tab portions having a slot arranged to engage and accept therein the printed wiring card edge opposite said handle



portion, whereby said stiffener bracket is retained to said printed wiring card.

4,427,255

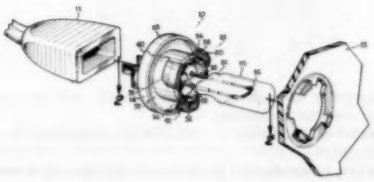
PLASTIC BASED GLASS HALOGEN LAMP

Charles W. Cox, Willoughby, Ohio, assignor to General Electric Company, Schenectady, N.Y.

Continuation of Ser. No. 94,065, Nov. 14, 1979, abandoned. This application Nov. 4, 1981, Ser. No. 318,167

Int. Cl.³ H01J *5/54;* **H01K** *1/46*

U.S. Cl. 339—127 C **8 Claims**



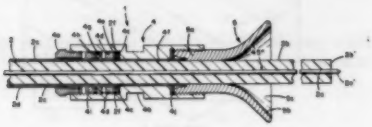
1. An unsealed reflector lamp assembly having a replaceable based halogen lamp lockingly engaged in focused position to a reflector comprising, in combination, an electrically insulating base, said lamp having a bulb containing a filament and having lead wires for said filament extending outwardly from said bulb in mutual parallelism and providing sole support of the lamp in said base, said lead wires having intermediate portions integrally formed with fixedly positioned preformed shoulders formed from the material of said lead wires and spaced a first predetermined reference distance from said filament, said base having interior channels through which said lead wires extend, said channels being integrally formed with seat portions located at a predetermined internal position along the length of said channels and complementary to and engaging said lead wire shoulders for positioning said filament a second predetermined reference distance from said base and positioning said bulb in spaced relation from said base; said base having exterior projecting ear means precisely located with respect to said channel seat portions and which serve to reference said base to the focus of the reflector when said based halogen lamp is lockingly engaged to said reflector.

4,427,256

HIGH VOLTAGE CABLE/CONNECTOR ASSEMBLY

Robert H. Reif, Groton, and Francis H. Stites, Wayland, both of Mass., assignors to GTE Products Corporation, Stamford, Conn.

Filed Apr. 15, 1982, Ser. No. 368,783
Int. Cl.³ H01R 15/24, 13/53
U.S. Cl. 339—143 C 10 Claims



1. A cable/connector assembly comprising:

an elongated high voltage cable including an electrically-conductive central conductor for receiving high-valued voltages, a continuous plastic dielectric surrounding the central conductor, and an electrically-conductive cable shield surrounding the dielectric for a portion of the length of the cable whereby the remainder of the dielectric is bare; and

a high voltage metal connector and metal corona shield arranged serially with each other and positioned in surrounding relationship with the cable with the portion of the cable having the bare dielectric extending longitudinally through and beyond the corona shield for a distance for minimizing the possibility of voltage arc-over between the central conductor of the cable and the corona shield;

said metal connector being secured to the cable and in physical and electrical contact with the cable shield; and

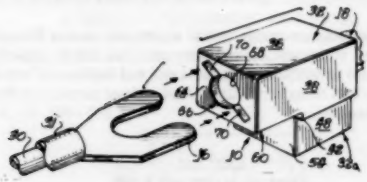
said corona shield being in physical and electrical contact with the metal connector and including a portion of a horn-like configuration directed upwardly and outwardly away from the metal connector and defining a cavity through which the aforesaid bare dielectric portion of the cable passes and extends longitudinally beyond the corona shield.

4,427,257

TERMINAL INSULATOR

Joseph P. DeMarco, 733 Western Ave., Park Ridge, Ill. 60068

Filed Oct. 13, 1981, Ser. No. 310,704
Int. Cl.³ H01R 13/64
U.S. Cl. 339—184 R 5 Claims



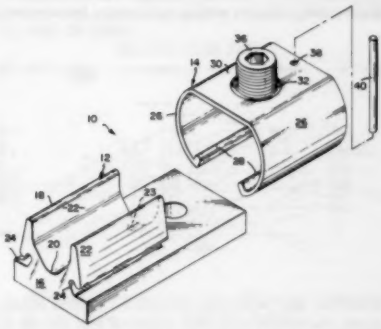
1. An insulator for an electrical terminal assembly including a first, relatively fixed terminal member and a second, relatively movable terminal member removably connectable with said first terminal member and having at least one wire affixed thereto, said insulator comprising: a unitary member of insulating material comprising tubular means for removably surroundingly engaging said first terminal member and including one open end and an oppositely facing end part for surrounding at least one wire being of sufficient internal dimension to permit passage of said second terminal member and said at least one wire therethrough, end wall means at a terminal end of said end part and passage means in said end wall means for permitting passage of said second teminal member and said at least one wire therethrough only when said second terminal member is oriented in a predetermined fashion with respect to said passage means, said predetermined orientation being different from the orientation of said second terminal member when connected with said first terminal member and surroundingly engaged by said insulator, and said tubular means further including an extension portion extending from said open end to said end part for accomodating an outwardly extending part of said terminal assembly.

4,427,258

ELECTRICAL CONNECTOR

Arthur L. Mueller, Camp Hill, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Filed Nov. 13, 1981, Ser. No. 321,000
Int. Cl.³ H01R 4/36
U.S. Cl. 339—272 R 1 Claim



1. An electrical connector comprising:

a. a channel-shaped first member with the floors and sidewalls defining a wire-receiving surface and further having an upwardly extending pin fixed at one end of the wire-receiving surface;

b. a second member having resiliently deformable, non-linear sidewalls and a top wall extruding between and joining the sidewalls at their upper edges, said second member being positioned over the first member with the lower edges of the non-linear sidewalls being attached to the sides of the first member with the wire-receiving surface therebetween and with the pin extending through the top wall for a predetermined distance; and

c. biasing means threadedly positioned in the top wall in alignment with the wire-receiving surface on the first member, said means adapted

for being turned down against a wire which may be lying on the wire-receiving surface and in so doing, resiliently deforming the sidewalls towards a more linear shape with the energy stored in the resiliently deformed sidewalls available to maintain pressure on the wire, and further as the top wall moves away from the wire-receiving surface, the top of the pin and upper surface of the top wall become closer together to indicate the degree of compressive force being exerted against the wire.

4,427,259

SELECTABLE FIELD-OF-VIEW INFRARED LENS

Thomas P. Fjeldsted, West Covina, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

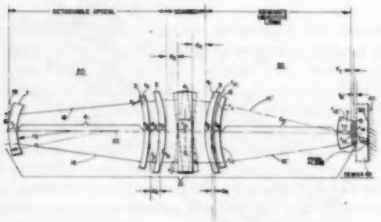
Filed Aug. 23, 1982, Ser. No. 410,789
Int. Cl.³ G02B 13/14
U.S. Cl. 350—1.3 8 Claims

1. A selectable field-of-view infrared lens for projecting an

image from object space onto a flat image plane, said selectable field-of-view infrared lens being corrected over the spectral region of 3.3 to 4.2 microns and having a selectable wide field-of-view comprising:

an objective lens system having a plurality of lens elements formed of material optically transparent over the spectral region of 3.3 to 4.2 microns, said plurality of lens elements each having a vertex and being coaxially aligned on a chief ray passing through each vertex and adapted to receive light from object space and to form an image on said flat image plane,

a selectable refractive Galilean afocal telescope having a plurality of lens elements formed of material optically transparent over the spectral region of 3.3 to 4.2 microns said plurality of lens elements having a vertex and being coaxially aligned on a chief ray passing through each vertex, said selectable refractive afocal telescope being coupled to said objective lens, said selectable refractive Galilean afocal telescope being in select field-of-view determining relation with said objective lens system; upon



selection, said selectable refractive Galilean afocal telescope cooperates with said objective lens system to provide a wide field-of-view,

a means for scanning, said means for scanning having an optical element having an optical center, said optical element being interposed between and coaxially aligned with said selectable refractive Galilean afocal telescope and said objective lens system, said means for scanning being adapted to oscillate said optical element through a predetermined angle, angularly displacing said collimated rays;

whereby, upon selection, said selectable refractive Galilean afocal telescope receives collimated light from object space and provides said collimated rays to said means for scanning optical element, said collimated rays passing through said oscillating optical element and being reciprocally displaced, said reciprocally displaced collimated rays passing to said objective lens system, said objective lens system focusing said reciprocally displaced collimated rays on said flat image plane; thereby, forming a reciprocally displaced image.

4,427,260

NON-LINEAR OPTICAL DEVICE WITH A COMPOSITE WAVEGUIDE AND RADIATION SOURCE USING SUCH A DEVICE

Claude Puech, and Michel Papuchon, both of Paris, France, assignors to Thomson-CSF, Paris, France

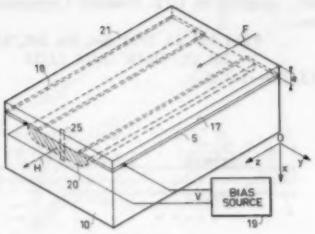
Filed Dec. 3, 1980, Ser. No. 212,276

Claims priority, application France, Dec. 14, 1979, 79 30720

Int. Cl.³ G02B 5/174

U.S. Cl. 350—96.14 **9 Claims**

1. A non-linear optical device for producing harmonic radiation from an instant fundamental radiation, said radiations being confined in a waveguide obtained by diffusing a metal ion from the surface of a lithium niobate substrate, wherein phase matching is obtained by coating the free face of the waveguide with at least one passive layer making the effective indices of a fundamental propagation mode and a harmonic



propagation mode coincide offering an overlap integral value exceeding that obtainable in the absence of said passive layer.

4,427,261

OPTICAL TRANSMISSION SYSTEM HAVING REDUCED MODAL NOISE

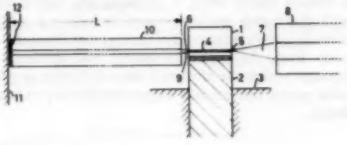
Giok D. Khoe, and Christiaan H. F. Velzel, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Jul. 13, 1981, Ser. No. 282,618

Claims priority, application Netherlands, Aug. 6, 1980, 8004472

Int. Cl.³ G20B 5/14

U.S. Cl. 350—96.20 **2 Claims**



1. An optical transmission system having reduced modal noise, which comprises:

a semiconductor laser diode having first and second end faces, said first laser end face being coupled to an optical transmission waveguide during operation of the system; and

a section of a monomode optical waveguide having first and second ends, said second laser end face being optically coupled to said first waveguide end and said second waveguide end being terminated in an at least partially reflective manner.

4,427,262

ARMOR WIRE SPLICES

Ronald C. Oldham, Chandless Ford, England, assignor to International Standard Electric Corporation, New York, N.Y.

Filed Jun. 4, 1981, Ser. No. 270,326

Claims priority, application United Kingdom, Jul. 8, 1980, 8022365

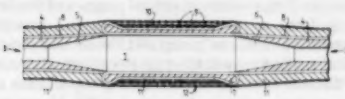
Int. Cl.³ G02B 7/26; H02G 3/06

U.S. Cl. 350—96.23 **17 Claims**

1. A joint for two elongate members, each including a core and at least one layer of armor wires laid up on the core, said joint comprising

first portions of said armor wires which extend beyond the respective core and onto the respective other core to overlap with the armor wires of the respective other elongate member,

a sleeve positioned on said wires at said region of overlap; and



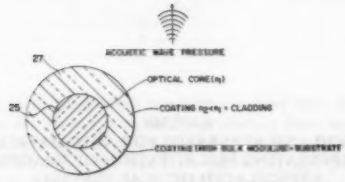
second portions of said armor wires constituting continuations of said first portions and turned back around the respective ends of said sleeve.

4,427,263

PRESSURE INSENSITIVE OPTICAL FIBER

Nicholas Lagakos, Silver Spring, Md., and Joseph A. Bucaro, Herndon, Va., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Apr. 23, 1981, Ser. No. 256,289
Int. Cl.³ G02B 5/172
U.S. Cl. 350—96.33 **16 Claims**



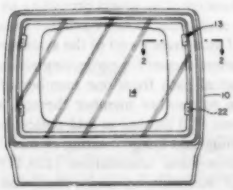
1. A pressure insensitive optical fiber waveguide comprising:
a solid cylindrical light transmitting core;
a cladding layer concentrically surrounding the core;
substrate means concentrically surrounding the cladding layer including a layer of glass having a bulk modulus substantially higher than that of the core;
said glass layer having a thickness such that external acoustic pressures thereon induce self cancelling phase shifts of light through the core;
thereby rendering the waveguide substantially insensitive to environmental acoustic conditions.

4,427,264

MOUNTING FOR OPTICAL ANTIGLARE PANEL AND ASSEMBLY INCLUDING THE SAME

Marc A. Kamerling, Santa Rosa, Calif., assignor to Optical Coating Laboratory, Inc., Santa Rosa, Calif.

Filed Jan. 12, 1981, Ser. No. 224,161
Int. Cl.³ G02B 27/00
U.S. Cl. 350—276 R **2 Claims**



1. An assembly comprising visual display means having an illuminated display area and a bezel surrounding the area, the bezel having holes located at spaced regions, mounting devices secured to the bezel, each device having portions extending within and locked within the holes, each mounting device having a flat front face, the faces of all the devices being substantially contiguous to a common plane spaced forwardly of the bezel, the front face of each mounting device having adhesively secured thereto a strip of securing means of the hook and loop type, a substantially flat antiglare panel, the rear surface of the panel having a plurality of strips adhesively secured to the same and being of the hook and loop type, the strips on the panel being located whereby the panel can be pressed against the mounting devices, with the strips on the panel being applied to and retained by the strips on the mounting devices, said strips forming the sole means for removably supporting and retaining the panel in a position in front of and spaced from the display area.

4,427,265

DIFFUSION PLATE

Takashi Suzuki; Kiyoshi Iizuka, both of Yokohama; Keiji Ohtaka, Tokyo, and Hidemasa Mizutani, Kawasaki, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 18, 1981, Ser. No. 275,406
Claims priority, application Japan, Jun. 27, 1980, 55-88029; Jun. 27, 1980, 55-88031
Int. Cl.³ G02B 5/02
U.S. Cl. 350—321 **4 Claims**

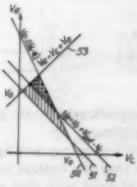
1. A diffusion plate having the following constructions formed on the surface of the substrate thereof:
microlens-like curved surfaces of a size of the order of 10 to several tens of μm arranged regularly and two-dimensionally;
curved surfaces between said microlens-like curved surfaces; and
minute concavo-convex surfaces irregularly arranged on said microlens-like curved surfaces.

4,427,266

DRIVING SYSTEM FOR MATRIX LIQUID CRYSTAL DISPLAY WITH NONLINEAR-SWITCHES

Minoru Hosokawa, Suwa, Japan, assignor to Kabushiki Kaisha Suwa Seikosha, Tokyo, Japan

Filed Sep. 24, 1981, Ser. No. 305,415
Claims priority, application Japan, Sep. 25, 1980, 55-133296
Int. Cl.³ G02F 1/133
U.S. Cl. 350—333 **10 Claims**



1. A matrix type liquid crystal display unit, comprising:
a plurality of liquid crystal display elements arranged in a matrix format;
a non-linear element in series with each of said plurality of liquid crystal display elements, said non-linear element having a current characteristic which is non-linear with respect to applied voltage;

column electrodes and line electrodes, each series combination of liquid crystal display element and non-linear element being connected between a column and line electrode;

line electrode driving means and column electrode driving means, said driving means being adapted to selectively apply driving signals of a plurality of voltage levels to said line and column electrodes, said voltage levels being applied to select a particular display element for one of OFF and ON states or to non-select said particular element, consecutive ones of said voltage levels being different by equal magnitudes, said non-linear element being non-conducting in said OFF and non-selected states.

4,427,267

METAL DIPHTHALOCYANINE ELECTROCHROMIC DISPLAYS AND ELECTROLYTES THEREFOR

Gilbert C. Collins, and David J. Schiffrin, both of Southampton, England, assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 2, 1981, Ser. No. 307,915

Claims priority, application European Pat. Off., Dec. 19, 1980, 80304653

Int. Cl.³ G02F *1/17*

U.S. Cl. 350—357 **9 Claims**

1. An electrochromic display device comprising

a counter electrode,

at least one display electrode in spaced relation to said counter electrode,

a layer of an electrochromic metal diphthalocyanine on said display electrode,

a solvent taken from the group consisting of a polyhydric alcohol, a polyhydric ether, a glyme and mixtures thereof in contact with said layer, and

a conductivity salt dissolved in said solvent to form an electrolyte in electrical contact with said counter electrode and said display electrode that enables said layer to be cycled between different colored states for an extended time period.

4,427,268

VARIABLE MAGNIFICATION RATIO LENS

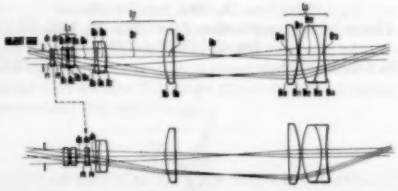
Keiji Ikemori, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 8, 1980, Ser. No. 166,798

Claims priority, application Japan, Jul. 10, 1979, 54-87117

Int. Cl.³ G02B *15/02*

U.S. Cl. 350—422 **6 Claims**



1. A variable magnification ratio lens system comprising:

a fixed first lens group;

a second positive lens group arranged at the back of the first lens group so that the optical axis of the second positive lens group is aligned with that of the first lens group;

an eyepiece arranged at the back of the second lens group so that the optical axis of the eyepiece is aligned with that of the second lens group;

first attachment optical means arranged to be in front of the first lens group and having a power with a sign different from that of the power of the first lens group; and

second attachment optical means arranged to be at the back of the first lens group alternatively to the first attachment optical means and having a power with a sign different from that of the power of the first lens group;

wherein the first attachment optical means and the first lens group form a substantial afocal optical system, and wherein the first lens group and the second attachment optical means form a substantial afocal optical system, and the distance between the first lens group and the second lens group is maintained constant and wherein the first lens group has a positive power, and wherein the first and the second attachment optical means have a negative power, whereby when the magnification factor is n, the afocal magnification ratio with the first attachment optical means and the first lens group is substantially $1/\sqrt{n}$, and that with the first group and the second attachment optical means is substantially $\sqrt{n}$.

4,427,269

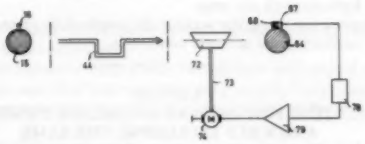
METHOD AND APPARATUS FOR AUTOMATICALLY COMPENSATING FOR ROTATION OF IMAGES IN ARTICULATED OPTICAL SYSTEMS

Walter Lang, Königsbronn; Erich Blaha, Essingen; Roland Schmauder, Oberkochen, and Franz Muchel, Königsbronn, all of Fed. Rep. of Germany, assignors to Carl-Zeiss-Stiftung, Heidenheim, Fed. Rep. of Germany

Filed Nov. 25, 1981, Ser. No. 324,998

Int. Cl.³ G02B *21/00*

U.S. Cl. 350—500 **7 Claims**



3. Apparatus for automatically compensating for rotation of an image projected through an articulated optical system and rotated as a result of relative movement of parts of the articulated system, said apparatus comprising an optical system including a plurality of members providing an optical path and articulated to each other to move relative to each other to alter the position of an entrance end of the system relative to an exit end of the system, means for projecting an image of an object along said optical path from one member of said articulated optical system to another member thereof, an optical image rotating element (**72**) located in said optical path, motor drive means for turning said image rotating element, a minicomputer (**130**), angular-position transmitters (**111,112**) responsive to movements of members of said articulated system, circuit means (**121,122**) for processing and delivering signals from said transmitters to said minicomputer, said minicomputer being arranged to produce a signal which is proportional to the total rotation of the image caused by movement of members of the articulated system, and means for controlling said motor drive means from such signal.

4,427,270

MICROSCOPE FRAME

Winfried Kraft, Asslar-Werdorf; Walter Froboese, Solms; Guenter Reinheimer, Biebertal, and Karl Wieber, Asslar-Berghausen, all of Fed. Rep. of Germany, assignors to Ernst Leitz Wetzlar GmbH, Wetzlar, Fed. Rep. of Germany

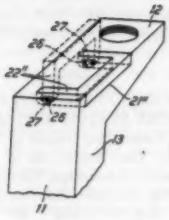
PCT No. PCT/DE79/00148, § 371 Date Aug. 20, 1980, § 102(e) Date Aug. 20, 1980, PCT Pub. No. WO80/01320, PCT Pub. Date Jun. 26, 1980

PCT Filed Dec. 18, 1979, Ser. No. 204,370

Claims priority, application Fed. Rep. of Germany, Dec. 22, 1978, 7838094[U]

Int. Cl.³ G02B *21/24*

U.S. Cl. 350—507 8 Claims



1. A microscope stand comprising a stand base, an upper support for optical components projecting from said stand base, a carrying grip mounted on said upper support of the microscope stand, and means for permitting said grip to be moved from an operative position extending upwardly from said upper support to a storage position received in said upper support.

4,427,271

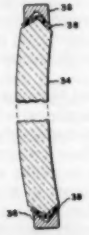
GASKETS FOR THIN GLASS LENSES MOUNTED IN OPHTHALMIC FRAMES

C. Davis Fogg, Rochester, N.Y., assignor to Bausch & Lomb Incorporated, Rochester, N.Y.

Filed Apr. 15, 1981, Ser. No. 254,562

Int. Cl.³ G02C *5/00*

U.S. Cl. 351—154 4 Claims



1. An ophthalmic lens gasket material, comprising:

a continuous loop of substantially flexible, heat shrinkable material having an initial size in an unheated state sufficient to fit over the peripheral edge of an ophthalmic lens at a first step of installation and shrinkable to a second size to closely fit about and be in, and remain in, intimate contact with the peripheral edge of the ophthalmic lens after application of sufficient heat to shrink the substantially flexible heat shrinkable material during a second manufacturing step.

4,427,272

ANISEIKONIA EYEGLASS LENS WITH PROGRESSIVE MAGNIFICATION

Hermann Gernet, Dunanstrasse 6, D-4400 Münster, Fed. Rep. of Germany

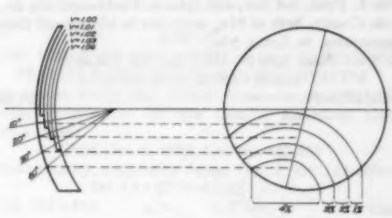
PCT No. PCT/EP79/00023, § 371 Date Dec. 4, 1979, § 102(e) Date Dec. 4, 1979

PCT Filed Mar. 27, 1979, Ser. No. 189,844

Claims priority, application Fed. Rep. of Germany, Apr. 5, 1978, 2814678

Int. Cl.³ G02C *7/02*

U.S. Cl. 351—173 2 Claims



1. An aniseikonia eyeglass lens to be worn in front of the non-operated eye of a patient with unilateral aphakia of pseudophakia, said lens having a portion each for far and near vision having no refractive powers or having refractive powers equal in both said portions, the improvement which comprises a thickness in the center of the lens, a number of strips in said near portion of said lens, said strips having anterior and posterior curvatures for a magnification for near vision which continuously progresses from strip to strip as the patient lowers the line of vision so that the retinal images in the two eyes of the patient are essentially of equal size.

4,427,273

FILM PROJECTION SYSTEM

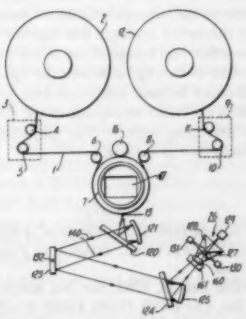
Thomas C. Mackereth, Burwell, and Tadeusz Zebrowski, Cambridge, both of England, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Nov. 20, 1981, Ser. No. 323,617

Claims priority, application United Kingdom, Dec. 8, 1980, 8039257; Aug. 12, 1981, 8124617

Int. Cl.³ G03B *1/00*

U.S. Cl. 352—183 12 Claims



1. A film projection system including a light source, film transport means for continuously transporting the film past an aperture through which light from the source is directed onto a detector and a guide for guiding the film in the region of the aperture to maintain a desired spacing between the film and the aperture, the part of the guide in contact with the film being

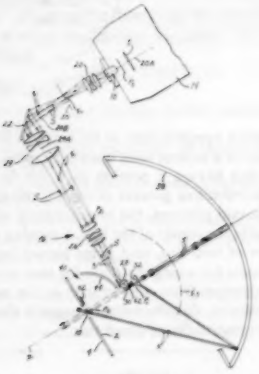
arranged to move at substantially the same velocity as the film, characterized in that in the region of the aperture the film is guided solely by guide elements which contact the film and move substantially at the velocity of the film; said guide elements are two endless bands each having a portion which engages with respective edges of the film; and that the transport means includes means for varying the spacing between the bands.

4,427,274

WIDE ANGLE PROJECTION SYSTEM

Marvin L. Pund, Bel Nor, and John A. VanHoogstrate, Jr., St. Louis County, both of Mo., assignors to McDonnell Douglas Corporation, St. Louis, Mo.

Filed Apr. 15, 1981, Ser. No. 254,417
Int. Cl.³ G03B *21/28, 21/56*
U.S. Cl. 353—99 **16 Claims**



1. A wide angle projection system comprising: a projector capable of emitting light in a desired pattern; a concave mirror out of direct alignment with said projector; a system of lenses for directing the light emitted from the projector toward the mirror and for spreading that light widely as it is directed toward the mirror, the lens system causing the light to form a real image of the desired pattern beyond the lens system and at a substantial distance in front of the mirror, the lens system emitting the light at a location such that the light upon reflecting from the mirror converges along a stationary axis toward a small area and thereafter diverges and the mirror causing the light to form another real image of the desired pattern beyond the small area and in the region where the light diverges; and a surface positioned beyond the small area generally at the location at which the other real image of the desired pattern is formed in the diverging light so that the other real image is generally in focus on the surface.

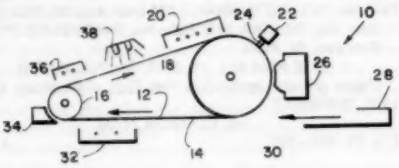
4,427,275

XEROGRAPHIC ELECTRONIC PRINTER

Henry Stalzer, Danbury, Conn., assignor to Pitney Bowes Inc., Stamford, Conn.

Filed Jul. 22, 1982, Ser. No. 400,802
Int. Cl.³ B41B *13/00*; G03B *41/00*
U.S. Cl. 354—4 **5 Claims**

1. An apparatus for producing a continuous line of dots formed on a charged photoconductive surface by the enabling of light emitting diodes, the system comprising: an imaging station made up of a plurality of longitudinally extending modules, each of said modules having a plurality of light emitting diodes arranged in at least one longitudinal row, means for moving a photoconductive surface past said modules, and means for selectively enabling the light emitting diodes of said



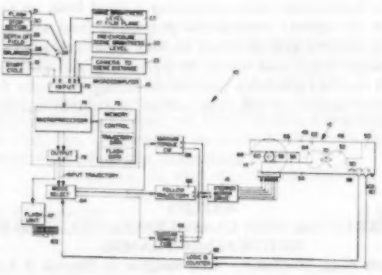
rows so that the light emitting diodes of adjacent modules are enabled sequentially in opposite longitudinal directions.

4,427,276

MICROCOMPUTER CONTROLLED PHOTOGRAPHIC EXPOSURE SYSTEM AND METHOD

Alan D. Feinerman, Cambridge; Donald L. Grimes, Milford, and Kathy J. Messina, East Boston, all of Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Filed Sep. 25, 1981, Ser. No. 305,690
Int. Cl.³ G03B *7/097*
U.S. Cl. 354—412 **27 Claims**



1. An exposure control system usable in a camera for controlling transmission of image forming light rays from a scene to a film unit located in a film plane, said system being operable in an imbient light mode and a flash mode wherein the scene is illuminated by a mixture of ambient light and artificial illumination provided from a combustible filament photoflash lamp which, when fired, may have light output characteristics that differ from its output specifications, said system comprising:

a blade mechanism;

means for mounting said blade mechanism for displacement between a first arrangement wherein it blocks transmission of scene light to the film plane and a second arrangement wherein it defines a maximum aperture, said blade mechanism serving to define a range of progressively increasing sized aperture as it moves from its said first arrangement toward its said second arrangement and then a range of progressively decreasing sized apertures as it returns to its said first arrangement during the course of an exposure interval for regulating transmission of scene light to the film plane;

drive means responsive to a program of trajectory signals for driving said blade mechanism in a manner whereby its operation is characterized by an aperture size versus time trajectory curve defined by said program of trajectory signals;

means for connecting a flash unit to said system which is responsive to a firing signal for firing such a flash lamp to provide a source of artificial illumination directed toward the scene;

means for selectively setting said system for either ambient light or flash mode of operation;

means for providing pre-exposure inputs indicative of scene brightness level and camera-to-scene distance and an exposure brightness input indicative of scene brightness level during the course of an exposure interval; and

control means operative upon actuation for controlling a cycle of system operation, said control means including a memory section having a preprogrammed trajectory and flash fire data base stored therein, said data base including at least characterizing elements of a plurality of different ambient light trajectory signal programs each correlated to a different range of ambient scene brightness levels, at least characterizing elements of a plurality of different flash mode trajectory signal programs each correlated to the specified light output characteristics of such a flash lamp and different combination of ranges of ambient scene brightness levels and camera-to-scene distances, and correlated flash firing time data for each of said flash mode trajectory signal programs, said control means further including means responsive to at least said preexposure brightness input, when said system is set for ambient light mode operation, for utilizing said data base and developing therefrom a program of trajectory signals to provide an ambient light trajectory curve appropriate for the indicated scene brightness level, and for feeding said program of trajectory signals to said blade drive means to effect exposure of the film unit and, when said system is set for said flash mode operation, being responsive to said pre-exposure brightness and camera-to-scene distance inputs for utilizing said data base and developing therefrom a program of trajectory signals to provide a flash mode trajectory curve appropriate for the indicated brightness and distance, for selecting the flash firing time corresponding to said developed program, for feeding at least an initial portion of said program to said drive means and providing a flash fire signal to said flash unit at said selected time to initiate an exposure cycle, and following initiation of said exposure cycle being responsive to said exposure brightness input for regulating the provision of said program signals to said drive means to adjust the shape of the trajectory curve for optimum exposure value in response to the light output characteristics of said flash lamp thereby compensating for deviations from its said specified output characteristics.

4,427,277

STRUCTURE FOR MOUNTING COVER FOR AUTOMATIC FOCUS DETECTING DEVICE

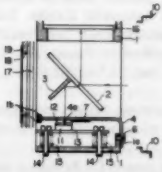
Keisuke Haraguchi, Ranzan, Japan, assignor to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 10, 1981, Ser. No. 300,865

Claims priority, application Japan, Sep. 10, 1980, 55-128626[U]

Int. Cl.³ G03B *3/00*

U.S. Cl. 354—402 **12 Claims**



1. A single-lens reflex camera of the type having an automatic focus detecting device including an automatic focus detecting element, the improvement comprising:

a cover member disposed over said focus detecting element and having an opening therein for limiting light incident to said automatic focus detecting element; and

a light intercepting member for covering said opening during a photographing operation, wherein said light intercepting member includes a confronting surface which faces the upper surface of said automatic focus detecting element when said opening is covered by said light intercepting member, and cleaning means on said confronting surface for contacting said upper surface of said automatic focus detecting element during movement of said light intercepting member to clean said upper surface of said automatic focus detecting element.

4,427,278

FLASH PHOTOGRAPHY SYSTEM AND ELECTRONIC FLASH DEVICE FOR USE IN THE SYSTEM

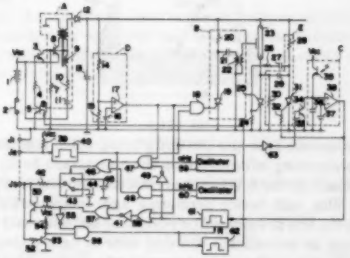
Tokuji Ishida, Daito, and Hiroshi Hosomizu, Sakai, both of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Oct. 4, 1982, Ser. No. 432,442

Claims priority, application Japan, Oct. 5, 1981, 56-159145

Int. Cl.³ G03B *15/05, 17/18*

U.S. Cl. 354—416 **9 Claims**



1. A flash photography system including an electronic flash device and a camera, said electronic flash device comprising;

a flash tube;

a main capacitor storing electricity for firing said flash tube;

a trigger means for initiating firing of said flash tube;

a light receiving means for receiving light reflected from an object or a scene;

an automatic flash light control means for generating a stop signal for stopping the firing of said flash tube when integration of the light received by said light receiving means reaches a predetermined level;

a detection means for generating a detection signal when said main capacitor is charged to a predetermined level;

a flash readiness signal generating means for generating a flash readiness signal in response to said detection signal;

a flash light control termination signal generating means for generating a flash light control termination signal in response to said stop signal for a given period of time; and

a terminal connected to said flash readiness signal generating means and said flash light control termination signal generating means for transmission of said flash readiness signal and said flash light control termination signal,

said camera comprising:

a terminal connectable to said terminal of said electronic flash device;

an automatic exposure control means capable of automatic shutter speed control in a daylight photography mode and a flash photography mode, said flash readiness signal and said flash light control termination signal, when transmitted to said terminal of said camera, causing said automatic exposure control means to effect automatic shutter speed control in the flash photography mode; and

a flash light control termination signal interrupting means

for generating an interrupting signal at said terminal of said camera in response to a camera release operation,

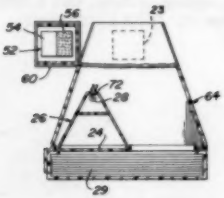
wherein said electronic flash device further comprises a control means for causing said flash light control termination signal generating means to interrupt the generation of said flash light control termination signal in response to said interrupting signal transmitted to said terminal of said electronic flash device.

4,427,279

CAMERA DEVICE FOR INCLUDING SEPARATE INFORMATION AREA ON PHOTOGRAPHS

Alan Edelstein, Philadelphia, and Allan M. White, Jenkintown, both of Pa., assignors to Micro Graphic Concepts Inc., Philadelphia, Pa.

Filed Aug. 26, 1981, Ser. No. 296,606
Int. Cl.³ G03B *17/24*
U.S. Cl. 354—107 **2 Claims**



1. In a camera having a lens and photographic film, a device for superimposing information on the photograph being taken, wherein said device is interposed between said lens and photographic film, said device permitting light images which pass through the lens to reach a first portion of said film, said device supporting an information carrying slide in light transmissive communication with a second portion of said film, said device comprising a frame divided into two sections, the first section being completely light transmissive and a second section being formed as an opaque, hollow, concave enclosure, said enclosure including a lamp and having an open face directed towards said film in which said slide is disposed, said device including means for adjusting the intensity of said lamp, wherein said lamp and said concave section cooperate to direct light of preselected intensity through said slide towards the film concurrently with the taking of a picture so that said light images and said information are concurrently registered on said film in a manner such that the level of exposure of said information is readily adjustable by said intensity adjusting means to produce a photograph having an information field and imagery whose respective levels of exposure are balanced relative to each other, as desired.

4,427,280

AUXILIARY POWER SOURCE DEVICE FOR MOTOR DRIVEN CAMERA

Tomonori Iwashita, Fuchu; Yukio Mashimo, Kawasaki; Hidehiko Fukahori, Yokohama, and Yoshitaka Watanabe, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

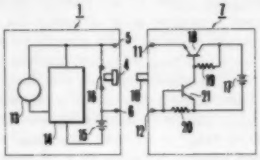
Filed Feb. 17, 1982, Ser. No. 349,458
Claims priority, application Japan, Feb. 24, 1981, 56-25972; Apr. 24, 1981, 56-25976
Int. Cl.³ G03B *1/04*
U.S. Cl. 354—173.11 **6 Claims**

1. An auxiliary power source device for a motor driven camera comprising:

an auxiliary power source;

a terminal for connecting the auxiliary power source to the power source of the motor driven camera so as to supply current to the winding motor of the motor driven camera;

detecting means to be connected between the auxiliary power source and the terminals so as to detect the load current to the winding motor; and



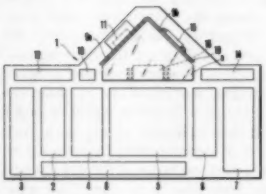
mens for lowering the voltage applied to the winding motor by means of the output of the detecting means when the detecting means detects that the load current reaches a predetermined value.

4,427,281

SINGLE LENS REFLEX CAMERA

Akira Yamada, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 12, 1982, Ser. No. 407,325
Claims priority, application Japan, Aug. 20, 1981, 56-130484
Int. Cl.³ G03B *13/02, 17/18*
U.S. Cl. 354—219 **6 Claims**



1. A single lens reflex camera including:

(a) a penta prism;

(b) an electrical power source;

(c) circuit parts for controlling camera operation;

(d) a flexible substrate electrically connecting said electrical power source to said circuit parts, said substrate being positioned along said penta prism; and

(e) a DC/DC converter positioned above said penta prism through said substrate, said DC/DC converter being electrically connected to said electrical power source and also electrically connected to said circuit parts.

4,427,282

MODE CHANGE OVER DEVICE FOR CAMERA

Masahisa Fujino, Musashino; Akio Sunouchi, Tokyo; Nobuyuki Suzuki, and Ryuji Suzuki, both of Kawasaki, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 25, 1982, Ser. No. 392,253
Claims priority, application Japan, Jul. 7, 1981, 56-106404
Int. Cl.³ G03B *9/02*
U.S. Cl. 354—271.1 **3 Claims**

1. A mode change over device for a camera having a diaphragm and capable of operating in a shutter time preference mode comprising:

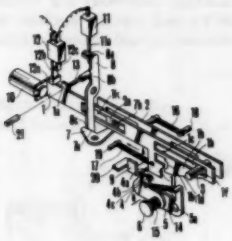
diaphragm closing means for bringing said diaphragm from a fully opened state into a closed state;

operation means for operating said diaphragm closing means, said operation means moving between a first position in which said diaphragm is brought into the fully opened state by said diaphragm closing means and a sec-

ond position in which said diaphragm is brought into the closed state by said diaphragm closing means;

lock means for locking said operation means in said first position;

release means for releasing the locked state of said lock means;



means for making the lock release operation of said lock means impossible; and

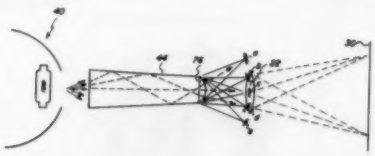
mode selection means for controlling said means for making the lock release operation impossible, said mode selection means being operative when said shutter time preference mode is selected.

4,427,283

SCRATCH SUPPRESSING ILLUMINATION SYSTEM FOR PHOTOGRAPHIC PRINTER

John Gasper, Hilton, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed May 21, 1981, Ser. No. 265,755
Int. Cl.³ G03B *27/00*
U.S. Cl. 355—1 **17 Claims**



1. In a color photographic printer having a printing lens and a film gate, an illumination system for illuminating the film gate, comprising:

a light source for producing a beam of light having a characteristic axial brightness distribution directed towards said film gate;

reflecting means disposed between said light source and said film gate for intercepting peripheral portions of said beam and redirecting said peripheral portions towards said film gate, so that the beam emerging from said reflecting means has a characteristic angular spread somewhere between about ±35° to about ±65°; and

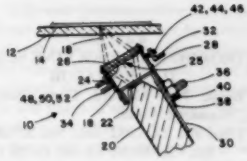
means for conditioning the light emerging from said reflecting means such that the image produced by said printing lens is substantially uniform, and such that said characteristic angular spread and said characteristic axial brightness distribution are substantially preserved, whereby scratch suppression and improved efficiency are achieved.

4,427,284

ADJUSTMENT MEANS FOR FIBER OPTIC ILLUMINATOR

Hugh S. L. Dannatt, Bethel, Conn., assignor to Pitney Bowes Inc., Stamford, Conn.

Filed Jun. 3, 1982, Ser. No. 384,820
Int. Cl.³ G03B *27/00*
U.S. Cl. 355—1 **4 Claims**



1. In a fiber optic illuminating system having a linear array of fiber ends and a platen for supporting an original document to be scanned and copied, the improvement comprising:

a flexible lens assembly situated intermediate said array of fiber ends and said platen;

a deflectable frame supporting said flexible lens assembly; and

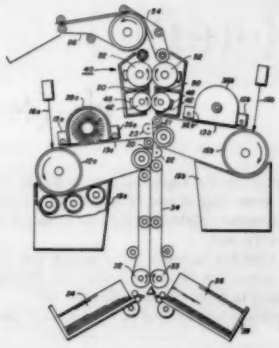
means for deflecting said deflectable frame whereby said flexible lens assembly can be transversely deflected to thereof modify the linearity of said lens assembly without disturbing the focal adjustment thereof.

4,427,285

DIRECT DUPLEX PRINTING ON PRE-CUT COPY SHEETS

Klaus K. Stange, Pittsford, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Feb. 27, 1981, Ser. No. 239,094
Int. Cl.³ G03G *15/00*
U.S. Cl. 355—3 FU **16 Claims**



1. In a reproduction machine for producing impressions of an original, the reproduction machine having a station for supplying discrete copy sheets, and a plurality of operating components cooperable with one another to produce the impressions on a copy sheet, the operating components including:

a first photosensitive member,

a first transfer station for transferring an image from the first photosensitive member onto a first side of a copy sheet,

a second photosensitive member,

a second transfer station for transferring an image from the second photosensitive member onto the opposite side of the copy sheet, and

a fuser station including,

fixing means having heated fuser rolls, and

compacting rolls disposed between the fixing means and the second transfer station, the fuser rolls operating at a lower peripheral velocity than the compacting rolls, the compacting rolls insulating the photosensitive member from the fuser station whereby the toner images are simultaneously tacked to each side of the copy sheet and conveyed to the fixing means.

4,427,286

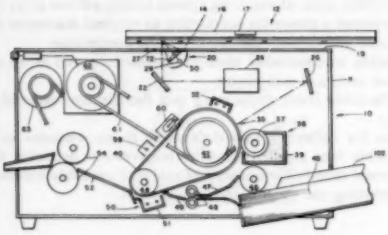
ELECTROPHOTOCOPIER LINE SCANNING ILLUMINATOR

Thomas W. Bosse, New Milford, Conn., assignor to Pitney Bowes Inc., Stamford, Conn.

Filed Jul. 12, 1982, Ser. No. 397,396

Int. Cl.³ G03G *15/04, 15/30*

U.S. Cl. 355—3 R **3 Claims**



1. A line scanning, illuminating apparatus, for use in an electrophotocopying machine, comprising:

a linear source of light;

a hyperbolic reflector situated behind the linear light source, the profile of the reflector being given by the equation:

$$y^2 = 2Bx\left[1+\left(\frac{A-B}{A+B}\right)\right] - x^2\left[1-\left(\frac{A-B}{A+B}\right)^2\right], \text{ where}$$

B=a point on the x axis and represents the distance between the center line of said reflector and a virtual image of the light source created behind said reflector, and is a positive quantity, and

A=a negative quantity representing the distance between the center line of said reflector and the linear light source located in front of said reflector; and

a cylindrical lens located in front of said linear light source.

4,427,287

COPYING MACHINE WITH AN AUTOMATIC DOCUMENT FEEDER

Hiroshi Matsumoto, Yokohama, and Tomoki Ogura, Ayase, both of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Nov. 2, 1981, Ser. No. 317,425

Claims priority, application Japan, Nov. 5, 1980, 55-155447; Nov. 5, 1980, 55-155467

Int. Cl.³ G03G *15/00*

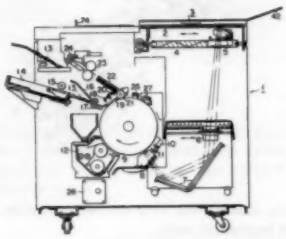
U.S. Cl. 355—14 SH **4 Claims**

1. A copying machine with an automatic document feeder, comprising:

(A) a copying machine main body which has a document table and which performs copying operation of a document on said document table;

(B) an automatic document feeder which automatically feeds the document onto said document table of said copying machine main body;

(C) a single motor which is disposed at the side of said copying machine main body and which drives a drive mechanism for said copying machine main body and a drive mechanism for said automatic document feeder;



(D) timing signal generating means, with a timing disk operative in synchronism with rotation of said motor, for generating a timing signal necessary for copying operation; and

(E) controlling means, disposed at the side of said copying machine main body, for controlling operation of said copying machine main body and said automatic document feeder according to the timing signal generated by said timing signal generating means.

4,427,288

IMAGE FORMING APPARATUS

Nao Nagashima, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 188,230, Sep. 17, 1980. This application Jan. 27, 1982, Ser. No. 343,188

Claims priority, application Japan, Sep. 26, 1979, 54-123631; Sep. 26, 1979, 54-123632

Int. Cl.³ G03G *15/00*

U.S. Cl. 355—14 R **4 Claims**

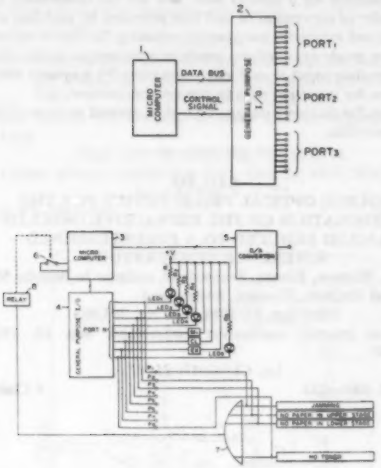
1. A reproducing apparatus comprising:

a plurality of processing means for reproducing an image;

instruction means for selectively operating one of said means; and

display means coupled to said instruction means for displaying data in response to a signal from said instruction

means, wherein said display means interrupts a previous display in response to said enabling means and carries out



a display in accordance with the signal from said instruction means.

4,427,289

TONER RECOVERY APPARATUS OF ELECTROSTATIC COPYING MACHINE

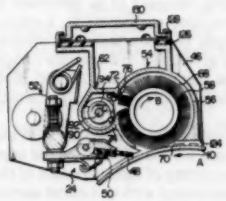
Goro Oda, Tokyo, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Continuation of Ser. No. 164,937, Jul. 1, 1980, abandoned. This application Sep. 28, 1982, Ser. No. 426,230

Claims priority, application Japan, Jul. 9, 1979, 54-85903; Jul. 9, 1979, 54-85904; Jan. 25, 1980, 55-6977

Int. Cl.³ G03G *21/00*

U.S. Cl. 355—15 **19 Claims**



1. A toner recovery apparatus for an electrostatic copying machine provided with a drum-shaped photosensitive body having a photosensitive layer laid on the outer circumference thereof and rotated in one direction and a developing device, said toner recovery apparatus comprising:

a cylindrical fur brush disposed substantially above said photosensitive body and forward, with respect to said one direction, of a vertical line passing through the center of said photosensitive body, said fur brush including a large number of elastic fibers on the outer circumference thereof;

first driving means for rotating said fur brush in a direction opposite to said one direction, free ends of said elastic fibers of said fur brush lightly contacting the surface of said photosensitive body during rotation of said fur bruch to enable said free ends to hold toner remaining on the surface of said photosensitive layer therebetween, thereby removing said remaining toner from said photosentitive body;

a cleaning blade having a tip and being disposed substantially above said photosensitive body downstream of said fur brush and upstream of said developing device with respect to said one direction, said blade tip being capable of contact with said photosensitive layer such that, when in contact with said photosensitive layer, said blade tip scrapes off said toner which has not been removed by said fur brush, thereby cleaning the photosensitive layer; and

second driving means for bringing said tip of said cleaning blade into contact with said photosensitive layer and said free ends of said fibers of said fur brush when said photosensitive body is rotated and for moving said cleaning blade away from said photosensitive layer when rotation of said photosensitive body is stopped, thereby enabling said toner removed from said photosensitive layer by said cleaning blade to be held between said fibers of said fur brush to be recovered.

4,427,290

TITLE EDGE APPARATUS FOR SERIALLY PRODUCED COLLATED COPY

Stanton Kaye, 2216 Los Angeles St., Berkeley, Calif. 94700, and Curtis Schreier, San Francisco, Calif., assignors to Stanton Kaye, Berkeley, Calif.

Continuation-in-part of Ser. No. 257,438, Apr. 24, 1981, Pat. No. 4,352,554. This application Oct. 8, 1981, Ser. No. 309,669

Int. Cl.³ G03B *27/52*

U.S. Cl. 355—40 **1 Claim**

1. In an optically scanning copier for serially reproducing copy from an original and for placing said reproduced copy in a collated array wherein said copy is used for further printing, the improvement comprising in combination:

an electronic memory for retaining titled information for imprintation onto an edge portion of said copy;

means for serially scanning successive raster lines of said retained titled information on a line raster basis by electronically scanning said electronic memory; and

light array means for synchronously printing said titled information onto the edge portions of successive pages of said copy, whereby when said successive pages of said copy are reproduced from said original and collated, the edge portions thereof display said titled information.

4,427,291

COMPACT OPTICAL IMAGING APPARATUS

Pierce B. Day, Pittsford, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed May 10, 1982, Ser. No. 376,472

Int. Cl.³ G03B *27/44*

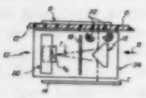
U.S. Cl. 355—46 **6 Claims**

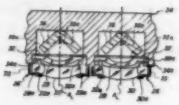
1. A compact optical imaging apparatus for projecting in focus an upright and wrong-reading light image of an informa-

tion bearing document in an object plane onto an image plane, said apparatus comprising:

a plurality of lenses located between said object plane and said image plane for projecting along an optical path a plurality of overlapping segments of a light image;

reflection means, located in said optical path between the object plane and said lenses, for directing a light image of an information bearing document in the object plane to said lenses;





a plurality of roof mirrors associated with said plurality of lenses respectively, said roof mirrors being located in said path to (i) receive such image segments from said lenses, (ii) reverse and invert such image segments, and (iii) reflect the image segments back through said lenses along said path toward the image plane; and

reflection means, located in said optical path between the image plane and said lenses, for directing such image segments from the lenses to the image plane to form an upright and wrong-reading image of the information bearing document in such plane.

4,427,292

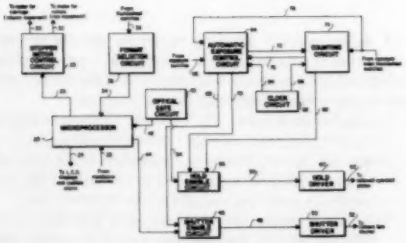
COMPUTER CONTROLLED MICROFILM CAMERA SYSTEM

Vernon G. Buchanan, Salt Lake City, Utah, assignor to Microsize, Inc., Salt Lake City, Utah

Filed Apr. 28, 1982, Ser. No. 372,825

Int. Cl.³ G03B 27/44

U.S. Cl. 355—54 **26 Claims**



1. A computer controlled microfilm camera system for use with reusable, single microfiche film cartridges, the system comprising:

means for (a) at least partially withdrawing the film from said cartridge to permit exposure of said film, and for (b) thereafter reinserting said film back into said cartridge when finished with its exposure;

first means for translating the film in incremental steps along a first direction corresponding to columns oriented with respect to said film;

second means for translating the microfilm in incremental steps along a second direction corresponding to rows oriented with respect to said film;

a pre-programmed microprocessor for (a) controlling the size of the incremental steps of the first and second means in response to format selection data input to said microprocessor by a system user, and for (b) controlling the order of movement of said film provided by said first and second means for purposes of exposing the film in either a row mode or a column mode in response to mode selection data input to said microprocessor by a system user;

means for inputting data to the microprocessor; and

means for focusing images onto the exposed portion of the microfilm.

4,427,293

DOUBLE OPTICAL PROBE DEVICE FOR THE DETERMINATION OF THE REFRACTIVE INDEX OF A LIQUID REDUCED TO A PREDETERMINED REFERENCE TEMPERATURE

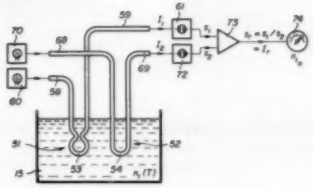
Alan L. Harmer, Bernex, Switzerland, assignor to Battelle Memorial Institute, Carouge, Switzerland

Filed Sep. 17, 1981, Ser. No. 303,083

Claims priority, application Switzerland, Sep. 18, 1980, 6998/80

Int. Cl.³ G01N 21/41

U.S. Cl. 356—133 **6 Claims**



4. A double optical probe device for the determination of the refractive index of a liquid reduced to a predetermined reference temperature, said device being adapted to give rise to an error which is more positive than the negative error inherent to a single optical probe device, characterized in that said device comprises:

a first and second optical probe each consisting of a light conducting body comprising an inlet section and an outlet section connected to each other by an intermediate section, at least said intermediate section of each of said probes being designed to be immersed in said liquid, and this intermediate section being, furthermore, adapted to convey light between said inlet section and said outlet section by giving rise to a quantity of light emerging from said outlet section of each of said probes which varies exponentially as a function of the refractive index of said liquid,

at least one light source associated with said inlet section of said first and second probes, for the injection of a predetermined quantity of light into each of these inlet sections,

and means associated with said outlet section of said first and second probes, for the elaboration of a resulting signal corresponding to the quotient of light quantities respectively emerging from said outlet sections, said intermediate sections of said first and second probes being, in addition, chosen, on the one hand, as regards their geometric arrangement, so as to have respective exponentiality coefficients "k_1" and "k_2" relative to the variations of the refractive index of the liquid such that "k_1" is higher than "k_2", and, on the other hand, as regards the constituent material thereof, so as to have apparent respective sensitivities "q_1" and "q_2", relative to the variations in temperature of this liquid such that "q_1" is lower than "q_2", so that said resulting signal elaborated at the outlet of said probes constitutes a signal which is representative of said refractive index of the liquid reduced to said reference temperature, the refractive index thus determined being, furthermore, tainted, for temperatures differing from this

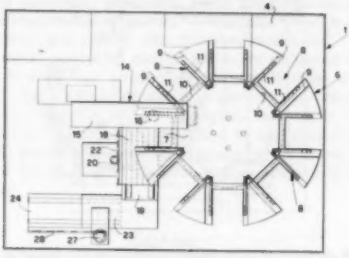
reference temperature, with an error which is more positive than that which would result from the use of a single probe.

4,427,294

APPARATUS FOR DENSITOMETRIC MEASUREMENT OF PROTEIC FRACTIONS SEPARATED BY ELECTROPHORESIS

Pietro Nardo, Via Galvani, 5, 20095 Cusano Milanino (MI), Italy

Filed Oct. 15, 1981, Ser. No. 311,774
Claims priority, application Italy, Oct. 21, 1980, 25474 A/80
Int. Cl.³ G01N *21/22*
U.S. Cl. 356—344 **5 Claims**



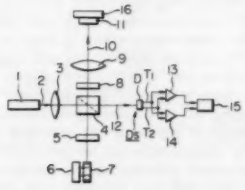
1. Apparatus for densitometric measurement of proteic fractions separated by electrophoresis comprising: a rotating indexing fixture with a plurality of circumferentially spaced seats, in each of which a support with a sample to be analyzed may be loaded, a reader arranged in such a way as to be met in succession by said seats, driving means for causing a combined radial and tangential movement of said reader with respect to said indexing fixture, an optical display, a graphic recorder, a magnetic recorder, a control keyboard and an electronic processor means for controlling different sequences of presenting the indexing fixture seats at said reader and different modes of presenting the detected data on said optical display, on said graphic recorder and on said magnetic recorder according to the orders given through said keyboard.

4,427,295

MEASURING APPARATUS

Keizo Nishiyama, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 969,883, Dec. 15, 1978. This application Jan. 4, 1982, Ser. No. 336,839
Claims priority, application Japan, Dec. 16, 1977, 52-152062
Int. Cl.³ G01B *11/30*
U.S. Cl. 356—371 **5 Claims**



1. A flatness measuring apparatus for measuring a one dimensional profile of a surface of a semiconductor silicon wafer or the like having integrated circuit patterns, large scale integrated circuit patterns or the like formed thereon, by detecting the absolute angular deviation of light regularly reflected from said surface in a scanning direction onto a position detecting photoelectric element, and by making an electric integration of the output of said photoelectric element, comprising:

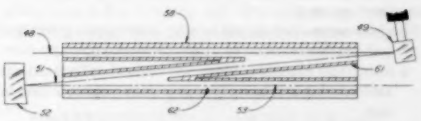
a laser light source for generating a laser beam, a variable focal length focusing lens system for focusing the laser beam generated by said laser light source on a fixed focal point, the focal length of said focusing lens system being adjustable to accommodate changes in the surface condition of the surface to be measured, a polarization beam splitter for directing said laser beam emanating from said laser light source toward said focal point, a first quarter wavelength plate disposed in the optical path of said laser beam between said beam splitter and said focal point, a unidimensional scanning optical system disposed at said focal point for directing said laser beam therefrom, a second quarter wavelength plate for receiving said laser beam directed from said scanning optical system, a collimator lens for receiving the laser beam from said second quarter wavelength plate and for establishing in conjunction with said focusing lens system an afocal system to project a parallel scanning beam from the laser beam onto said surface at a substantially normal incident angle, the cross sectional area of said scanning beam on said surface being enlargeable to cover at least the size of any one of said patterns, in accordance with changes in the surface conditions of said surface, by changing the focal length of said focusing lens system, while maintaining said afocal system.

4,427,296

ELECTRO-OPTICAL MEASURING SYSTEM

Frank C. Demarest, Killingworth, and Richard A. Iderosa, Rocky Hill, both of Conn., assignors to Zygo Corporation, Middlefield, Conn.

Filed Sep. 3, 1981, Ser. No. 299,209
Int. Cl.³ G01B *11/00*; G02B *5/14*
U.S. Cl. 356—387 **7 Claims**

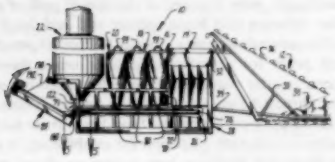


1. In an electro optical measuring system comprising (1) a source of radiant energy which produces a narrow collimated beam, (2) means for converting said narrow beam into a uniformly rotationally scanned beam, (3) means for converting said rotationally scanned beam into a parallel scanned beam, (4) means for collecting and photosensing the portion of said parallel scanned beam which passes by the edges of an object being measured, (5) means for processing the photosensor output to produce signatures indicating the coincidence of the center of said parallel scanned beam with said edges, and (6) means for processing said signatures to indicate the size of said object, and (7) in which system the path of said scanned beams between means (2) and said object to be measured is occupied by ambient air, the improvement which comprises providing (8) very narrow shielded passages for said path of said scanned beams in said region (7), of proper dimensions to insure that heat transfer in said region (7) occurs almost completely by conduction and radiation rather than by convection.

4,427,297
CONCRETE INGREDIENT METERING DEVICE

Joseph F. Stastny, Indianola, Iowa, assignor to Cemen-Tech, Inc., Indianola, Iowa

Filed Apr. 16, 1982, Ser. No. 369,150
Int. Cl.³ B28C 7/04, 7/06
U.S. Cl. 366—19 7 Claims



1. An improved metering means for a concrete mixing assembly comprising a conveyor having a first end and a discharge end, an aggregate hopper positioned above said conveyor adjacent said first end, at least one fine ingredient hopper above said conveyor adjacent said aggregate hopper; a cement hopper above said conveyor adjacent said fine ingredient hopper, mixing means adjacent said conveyor discharge end for receiving and mixing ingredients delivered to said discharge end of said conveyor, metering means within at least one of said cement and fine ingredient hoppers for metering and depositing the contents of said one hopper on said conveyor; said improved metering means comprising:

a cylindrical housing for said metering means comprising a top wall, a circular bottom wall and a cylindrical side wall,

said top wall having an inlet opening therein and said bottom wall having an outlet therein, said inlet opening comprising only a portion of the area of said top wall, said outlet opening comprising only a portion of the area of said bottom wall, and being circumferentially offset from said inlet opening,

hopper means connected to said inlet opening for feeding pulverulent material to said inlet opening,

a rotor shaft extending along the vertical cylindrical axis of said housing and being rotatable with respect to said housing;

a metering wheel fixed to said shaft above said bottom wall for rotation in unison with said shaft; said wheel comprising a hub and a plurality of pocket openings extending vertically through said wheel and positioned in a circular array around said hub, each of said pocket openings being open at top and bottom;

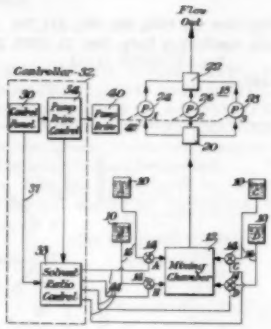
power means connected to said shaft for rotating said shaft whereby pulverulent material will fall from said hopper means through said inlet opening and said feed opening and will be carried circumferentially by said pocket openings of said metering wheel to said outlet opening where it will fall downwardly out of said housing through said outlet opening; and

adjustment means for permitting selective adjustment of the size of said inlet opening, said adjustment means comprising a closure plate movably mounted to said rotor shaft for movement from a first position away from said inlet opening to a second position at least partially blocking said inlet opening.

4,427,298
METHOD AND SYSTEM FOR ACCURATELY PROVIDING FLUID BLENDS

Edward J. Fahy, Wilmington, Del., and John C. Steichen, Landenberg, Pa., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Sep. 30, 1982, Ser. No. 430,837
Int. Cl.³ B01F 15/02
U.S. Cl. 366—132 11 Claims



1. A method of accurately controlling the blend of components, derived from plural fluid reservoirs, in a fluid stream by cyclically time proportioning the flow from each reservoir to a mixer to form the fluid stream and cyclically pumping the fluid stream to a utilization device comprising the steps of:

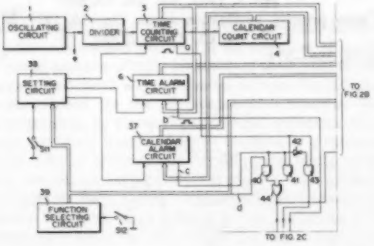
adjusting the cyclic rate of the pump to provide a desired flow rate, and

adjusting the time proportioning cyclic rate to be asynchronous with the pump cyclic rate whereby the blend of the components of the fluid stream is accurately maintained.

4,427,299
ELECTRONIC DEVICE WITH AN ALARM FUNCTION

Minoru Hasegawa, Kodaira, Japan, assignor to Casio Computer Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 197,270, Oct. 15, 1980, abandoned.
This application Apr. 11, 1983, Ser. No. 483,416
Claims priority, application Japan, Oct. 22, 1979, 54-146027[U]; Dec. 11, 1979, 54-171453[U]
Int. Cl.³ G04B 19/24, 23/02
U.S. Cl. 368—29 10 Claims



1. An electronic device with an alarm function comprising:

a source of reference clock signals;

time counting means for counting said reference clock signals from said source to provide time data;

display means for displaying said time data from said time counting means;

date counting means for counting a one-day signal produced from said time counting means to obtain date data;

a time alarm circuit for producing a first alarm sound generation instruction signal each time the time data produced from said time counting means reaches an alarm time;

alarm sound generating means coupled to said time alarm circuit for generating a predetermined alarm sound when the first alarm sound generation instruction signal is received, said alarm sound generating means being capable of generating a plurality of alarm sounds;

specific date detecting means coupled to said date counting means for detecting that the date data obtained by said date counting means reaches a specific date and for producing a specific date signal;

inhibiting means for inhibiting the supply of said first alarm sound generating instruction signal to said alarm sound generating means when said specific date signal is delivered from said specific date detecting means; and

alarm sound generation control means for supplying a second alarm sound generation instruction signal to said alarm sound generating means in place of said first alarm sound generation instruction signal, said alarm sound generating means being responsive to said second alarm sound generation instruction signal to generate an alarm sound which is different from said predetermined alarm sound.

4,427,300

TIMEPIECE WITH A PERPETUAL CALENDAR MECHANISM

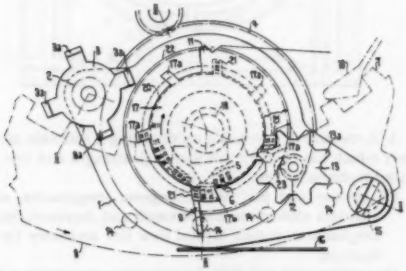
Michel Groothuis, Saint-Imier, Switzerland, assignor to Compagnie des Montres Longines, Saint-Imier, Switzerland

Filed Nov. 3, 1981, Ser. No. 317,877

Claims priority, application Switzerland, Nov. 7, 1980, 8272/80

Int. Cl.³ G04B *19/24*

U.S. Cl. 368—37 **8 Claims**



1. An improved timepiece with a perpetual calendar mechanism of the type having a rotationally displaceable date-disc for indication of the date of the month, said date-disc being moveable in discrete angular displacement steps, drive means for rotating said date-disc and determining means for determining the number of displacement steps of said date-disc, said determining means being driven at the end of each calendar month by said date-disc and cooperating with said drive means so that said date-disc indicates the transition from the end of the month to the beginning of the next month, wherein the improvement comprises said determining means having:

(a) a months cam rotatable one full turn per year, said months cam having an outer periphery and month finger-pieces radially projecting from said periphery for sweeping a rotational path and for interaction with said drive means, each of said month finger-pieces having different angular widths for determining different durations of interaction with said drive means; and

(b) a years cam rotatable one full turn in four years having an outer periphery and year finger-pieces radially projecting from said periphery for sweeping a rotational path cooperating with said month finger-pieces and said drive means for determining the number of date-disc rotation steps necessary to indicate the last day of the month and activate the drive means in order to advance the date-disc to the first date of the month even during leap years.

4,427,301

TIMEPIECE WITH AN ACTIVATING MECHANISM

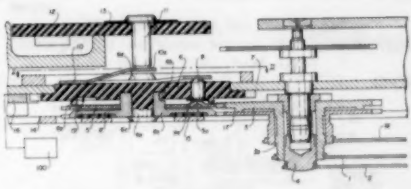
Willy Cleusix, Le Landeron, Switzerland, assignor to Ebauches Electroniques S.A., Marin, Switzerland

Filed Feb. 26, 1982, Ser. No. 352,623

Claims priority, application Switzerland, Feb. 26, 1981, 1319/81

Int. Cl.³ G04B *23/02*

U.S. Cl. 368—72 **10 Claims**



1. A timepiece comprising a movement and an activating mechanism operatively connected to said movement for producing, at a presettable time, the closing of an electrical contact, the time-piece comprising:

a framework; a first contact member of a first material; a first support rotatably mounted on said framework and rotationally coupled to said movement, for carrying said first contact member; a second contact member of a second material; a second support mounted on said framework, in a position which is rotationally adjustable about the axis of rotation of said first support, for carrying said second contact member, said second contact member being located at substantially the same distance from said axis of rotation as said first contact member; and said first and second materials being chosen to comprise magnetic coupling means for bringing said first and second contact members into contact when they have been rotated with said supports into positions opposite each other.

4,427,302

TIMEKEEPING SIGNAL SOURCE FOR AN ELECTRONIC TIMEPIECE

Shinichi Watanabe, Tanashi, Japan, assignor to Citizen Watch Company Limited, Tokyo, Japan

Filed Jun. 1, 1981, Ser. No. 269,296

Claims priority, application Japan, Jun. 6, 1980, 55-076210; Oct. 13, 1980, 55-141959

Int. Cl.³ G04G *3/02*

U.S. Cl. 368—200 **11 Claims**

1. A timekeeping signal source for an electronic timepiece, comprising:

low frequency oscillator circuit means including frequency changeover means for switching the frequency of oscillation thereof at least between a higher and a lower frequency;

high frequency oscillator circuit means having a frequency of oscillation which is an integral multiple of a frequency intermediate between said higher and lower frequencies of oscillation of said low frequency oscillator circuit means;

primary frequency divider circuit means for frequency dividing an output signal produced by said low frequency

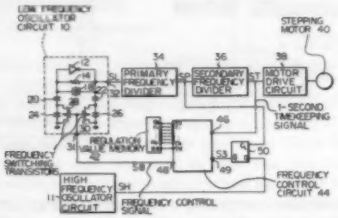
oscillator circuit means, to thereby produce a primary frequency division signal;

secondary frequency divider circuit means for frequency dividing said primary frequency division signal, to thereby produce a timekeeping signal;

phase comparison means for comparing the phase of said primary frequency division signal with the phase of an output signal from said high frequency oscillator circuit means, to produce a phase signal comprising a train of pulses;

timekeeping rate setting means for producing timekeeping rate setting information to designate an amount of adjustment of the timekeeping rate of said electronic timepiece; and

frequency control circuit means coupled to receive said phase signal and said timekeeping rate setting information, comprising bistable circuit means coupled to receive said phase signal for thereby producing a basic frequency control signal, inhibit gate circuit means for transferring



said basic frequency control signal to be output as a frequency control signal, and counter circuit means periodically enabled to count pulses of said phase signal to produce an output signal which is applied to said inhibit gate circuit means to inhibit transfer of said basic frequency control signal to said frequency changeover means, said inhibit operation being continued during a time interval in which a number of pulses of said phase signal are counted, said number of pulses being determined in accordance with said timekeeping rate setting information, said frequency control signal being applied to said frequency changeover means for thereby selectively setting said low frequency oscillator circuit means frequency of oscillation to said higher and lower frequencies thereof, whereby adjustment of said timekeeping rate is performed by said frequency control signal being held at a fixed potential during said time interval to thereby fix the frequency of oscillation of said low frequency oscillator circuit means output signal at one of said higher and lower frequencies thereof during said time interval.

4,427,303

ELECTRONIC WRISTWATCH

Jan H. Matthias, Beverly Hills, Calif., assignor to Hermann Hirsch Leder und Kunstoffwarenfabrik, A-Klagenfurt, Austria

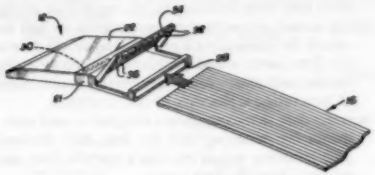
Filed Jun. 17, 1982, Ser. No. 389,426
Int. Cl.³ G04B *37/00*
U.S. Cl. 368—282 **3 Claims**

1. An electronic device to be worn on a user's wrist, comprising:

a flexible wrist band having a plurality of connector wires and an insulator material encasing the wires;

a first electronics module electrically coupled to the connector wires of the wrist band; and

a second electronics module having a plurality of connector pins for piercing the insulator material at a desired location along the wrist band and for making electrical contact



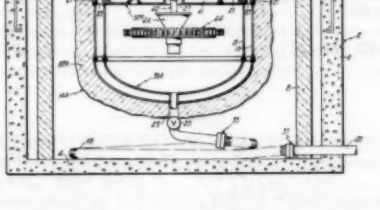
between the second electronics module and the connector wires of the wrist band.

4,427,304

METHOD FOR CRYOGENIC PROOF TESTING OF ROTATING PARTS

Frank C. Gillette, Jr., Lake Park; Ernest C. Bryan, Tequesta, and Douglas H. Nethaway, Stuart, all of Fla., assignors to United Technologies Corporation, Hartford, Conn.

Filed Apr. 7, 1982, Ser. No. 366,114
Int. Cl.³ G01N *25/00*
U.S. Cl. 374—46 **6 Claims**



1. A method of cryogenic proof testing a rotatable metallic part which has characteristics of high strength and low fracture toughness is comprised of:

(1) placing said part at a cryogenic temperature, which increases ultimate tensile strength and decreases fracture toughness to reduce critical flaw size necessary for part fracture;

(2) rotating said part at said cryogenic temperature and at a speed equivalent to a stress level not to exceed 0.2% yield strength of the metallic part so that no detrimental permanent deformation of said part occurs while producing a stress on said part to fracture said part at or above the reduced critical flaw size.

4,427,305

ANALYZER FOR DISTILLABLE MATERIALS

Albert G. Plys, South Holland, Ill.; Thorpe Dresser, Green Valley, Ariz.; Stanley Ohlswager, Olympia Fields, and Lee G. Peterman, Flossmoor, both of Ill., assignors to Atlantic Richfield Company, Philadelphia, Pa.

Filed Jul. 13, 1981, Ser. No. 282,462
Int. Cl.³ G01N *25/14*
U.S. Cl. 374—45 **17 Claims**

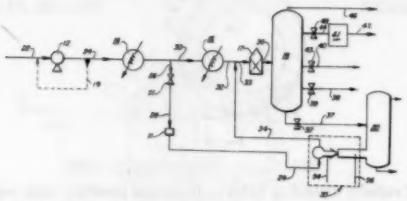
1. An analyzer for determining volatile composition changes of a distillable material comprising:

(a) a first means for causing at least a portion of said material to be at a temperature and at a pressure so that a difference in

temperature of said portion of said material across an isenthalpic expansion at critical flow conditions would be at least about 5° F.;

(b) a second means for carrying out said isenthalpic expansion on said at least a portion of said material;

(c) a third means for measuring at least two temperatures of said material where said at least two temperatures are a first



and a second temperature, said first temperature being measured upstream of said expansion and said second temperature being measured downstream from said expansion; and

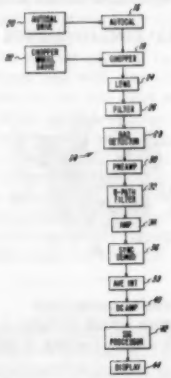
(d) a fourth means for maintaining pressure downstream of said expansion to a value which does not vary by an amount in excess of about 20% of said pressure downstream of said expansion.

4,427,306

RADIOMETER APPARATUS FOR AIR DISTURBANCE DETECTION

Hugh P. Adamson, Golden, Colo., assignor to University Patents, Inc., Norwalk, Conn.

Filed Aug. 4, 1980, Ser. No. 175,117
Int. Cl.³ G01J *5/08*
U.S. Cl. 374—128 **4 Claims**



1. A radiometer apparatus with a high signal to noise ratio useful for detecting disturbances in air by measurement of sensed temperature differences, said apparatus comprising:

signal developing means for receiving temperature indications relating to disturbances in air and providing an electronic signal output indicative thereof; and

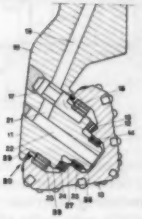
signal processing means including active filtering and integrating means connected with said signal developing means to receive said electronic signal output therefrom and responsive thereto providing an integrated signal with a high signal to noise ratio whereby said signal processing means provides an output signal having a signal level accurately indicative of temperature differences received by said apparatus, said signal processing means including synchronous demodulator means and said active filtering and integrating means including an averaging integrator integrating said output signal from said synchronous demodulator means, with said averaging integrator including signal chopping means operable at a predetermined frequency, switching means connected with said chopping means and receiving said output signal from said synchronous demodulator means, comparison means connected with said chopping means to receive said output signal therefrom, frequency doubling means connected with said signal chopping means, and sample and hold means connected with said comparison means and said frequency doubling means whereby an output signal is provided from said averaging integrator having a high signal to noise ratio.

4,427,307

ROTARY DRILL BIT

Lars G. Norlander, Surte; Erik T. Brask, Sandviken, and Rolf R. Moren, Sandviken, all of Sweden, assignors to Sandvik Aktiebolag, Sandviken and Aktiebolaget SKF, Goteborg, both of, Sweden

Filed Oct. 5, 1981, Ser. No. 308,893
Claims priority, application Sweden, Dec. 3, 1980, 8008471
Int. Cl.³ F16C *19/38, 33/36*
U.S. Cl. 384—93 **13 Claims**



1. Rotary drill bit comprising a bit body, at least one roller cutter rotatably carried on the bit body by means of a bearing system, said bearing system comprising at least one roller bearing including a plurality of rollers, passage means is provided in the bit body for supplying a lubricant-containing gas flow to the bearing system for flushing and lubricating and cooling thereof, gas outlet means disposed downstream of said bearing system with reference to the direction of gas flow for discharging said gas flow from said drill bit, at least one of the rollers in the roller bearing being provided with a bore which extends axially therethrough for conducting the gas flow therethrough to reduce the velocity of the gas flow and minimize the tendency for the gas flow to strip lubricant from the rollers.

4,427,308

HYDROKINETIC SPINDLE ASSEMBLY

John R. Sandberg, 926 Main St., Robstown, Tex. 78380

Filed Feb. 1, 1982, Ser. No. 344,474
Int. Cl.³ F16C *32/06, 33/10*
U.S. Cl. 384—115 **10 Claims**

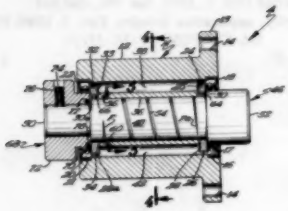
1. A hydrokinetic spindle comprising:

(a) a housing,

(b) a shaft having a first end and a second end,

(c) means mounting said shaft in said housing for relative rotative motion between said housing and said shaft,
(d) said housing including reservoir means for a lubricating fluid spaced radially outwardly of said shaft,
(e) said shaft having a helical groove formed in the surface thereof and extending thereon and having a first end and a second end with the cross-section of the groove progressively decreasing from the first end of the groove to the second end of the groove,
(f) means for conducting the lubricating fluid from said reservoir means to said first end of said helical groove and upon said shaft,
(g) means for conducting the lubricating fluid from said second end of said helical groove and from upon said shaft to said reservoir means for creating hydraulic pressure in conducted lubricating fluid upon the shaft as relative rotation between said shaft and said housing occurs, and
(h) means for sealing the lubricating fluid within the housing.

7. A hydrokinetic spindle comprising:
(a) a housing,
(b) a shaft,



(c) means mounting said shaft in said housing for relative rotative motion between said housing and said shaft,
(d) said housing including reservoir means for a lubricating fluid spaced radially outwardly of said shaft,
(e) said shaft having a helical groove formed in the surface thereof and extending thereon and having a first and second end for picking up a predetermined amount of lubricating fluid at a first portion of the shaft and directing the lubricating fluid to and upon the shaft under pressure to a second portion of the shaft,
(f) means for conducting the lubricating fluid from said reservoir means to said first portion of said shaft and upon said shaft,
(g) a thrust washer carried by said shaft with a spiral groove formed on a face of said washer for conducting the lubricating fluid from said second portion of said shaft and from upon said shaft to said reservoir means for creating hydraulic pressure in conducted lubricating fluid upon the shaft as relative rotation between said shaft and said housing occurs, and
(h) means for sealing the lubricating fluid within the housing.

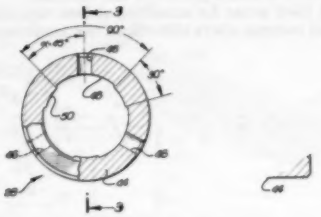
4,427,309

TURBOCHARGER SHAFT BEARING

James E. T. Blake, Manhattan Beach, Calif., assignor to The Garrett Corporation, Los Angeles, Calif.

Continuation of Ser. No. 133,008, Mar. 24, 1980, abandoned.
This application Feb. 3, 1982, Ser. No. 345,493
Int. Cl.³ F16C *33/10, 27/02, 17/18*
U.S. Cl. 384—286 **11 Claims**

1. A rotationally floating shaft bearing for use in a turbocharger, comprising a generally cylindrical unitary sleeve having a generally circular outer diameter, and an inner diameter defining at least three equiangularly arranged and substantially identical arcuate lands formed on a common radius and separated by a corresponding plurality of substantially identical arcuate recesses formed on a common radius slightly greater than the radius of said lands, said lands and recesses being formed on a common center and extending axially the length of said sleeve, said recesses having a total arcuate width of from about one to about three times the total arcuate width of said lands, and said sleeve having formed therein a plurality



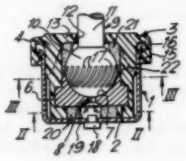
of radially extending holes in alignment centrally with respect to the arcuate widths of respective ones of said recesses for communicating lubricating oil centrally into said recesses.

4,427,310

LUBRICATED BEARING

Andrew H. Middleton, Southampton, England, assignor to British Gas Corporation, London, England

Filed May 14, 1982, Ser. No. 378,234
Claims priority, application United Kingdom, Jul. 10, 1981, 8121273
Int. Cl.³ F16C *33/10, 27/08, 11/06*
U.S. Cl. 384—415 **18 Claims**



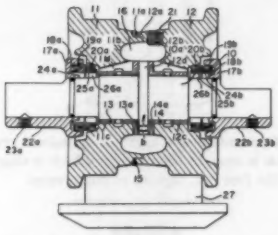
1. A lubricated bearing comprising:
a rotatable structure which includes a housing having an interior surface and an opening at one end defined by a rim;
a bearing cup with a mouth at one end;
a retaining member which is separate from the bearing cup and which grips the housing and also grips the bearing cup, said retaining member securing the bearing cup within the housing in spaced relationship to the interior surface thereof, with the mouth of the bearing cup directed towards the opening of the housing and with a lubricant space defined between the interior surface of the housing and the bearing cup and extending on both sides of a plane defined by the mouth of the bearing cup;
a stationary member having a bearing part shaped to fit within the bearing cup and present mutually cooperating relatively rotatable bearing surfaces and a part arranged to project from the housing through its opening; and
means for preventing the discharge of lubricant from the opening of the housing as the housing rotates.

4,427,311

TRACK ROLLER DEVICE

Hideo Takenaka, 10-16, Kugahara 6-chome, Ohta-ku, Tokyo, Japan

Continuation of Ser. No. 177,160, Aug. 11, 1980, abandoned.
This application Aug. 19, 1982, Ser. No. 409,756
Claims priority, application Japan, Aug. 17, 1979, 54-113203
Int. Cl.³ F16C 13/00, 33/10
U.S. Cl. 384—418 5 Claims



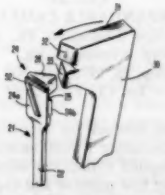
1. A track roller, comprising: a shaft having a substantially centrally located, annular, shaft collar projecting radially outwardly therefrom at the center of the shaft; a pair of annular bushings rotatably supported on said shaft on opposite sides of said shaft collar, said bushings each having a radially outwardly extending flange at the axially inner end thereof, said flanges being opposed to and being axially spaced small distances from the axial surfaces of said shaft collar, respectively; a pair of coaxial, annular rollers press-fitted on and supported for rotation with respect to said shaft by said bushings directly, respectively, said rollers having adjacent, axially inner, opposed end walls, one of said rollers having a radially outwardly facing, circumferentially extending, outer surface adjacent to the radially outer edge of its axially inner end wall, the other of said rollers having a radially inwardly facing, circumferentially extending, inner surface adjacent to the radially outer edge of its axially inner end wall, said inner surface of said other roller being sleeved on said outer surface of said one roller, said rollers being welded together to form a unitary body, said axially inner opposed end walls of said rollers each having an annular recess therein located radially inwardly from said surfaces, said recesses mating to define an enlarged annular oil chamber encircling the radially outer edge of said shaft collar and locating between the said rollers and the shaft, said rollers having oil flow passages extending from said annular oil chamber to the surface of the shaft.

4,427,312

PRINTWHEEL DETENT

William L. Dollenmayer, Versailles, Ky., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Sep. 8, 1982, Ser. No. 415,859
Int. Cl.³ B41J 1/30
U.S. Cl. 400—144.2 8 Claims



1. A printwheel for a printer, said printwheel including a hub portion and a plurality of radially extending petals projecting therefrom;

said petals having indicia on one surface thereof, and a striking surface on the opposite surface thereof;

said striking surface comprising first and second radially spaced apart inclined surfaces, each of said inclined surfaces comprising a generally planar surface extending substantially the full width of its associated petal, each of said inclined surfaces being disposed, with respect to the other, to subtend an angle, when viewed radially of said printwheel, between said inclined surfaces;

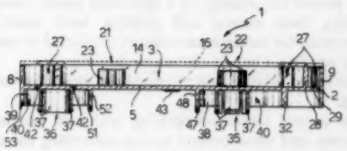
each of said inclined surfaces disposed to be engaged during every printing operation involving their associated indicia by complementary inclined surfaces on a print hammer whereby angular misalignment between said hammer and a petal may be compensated for by angular deflection of said petal to effect a detenting between said complementary inclined surfaces of said petal and said print hammer.

4,427,313

RIBBON CARTRIDGE FOR A TYPEWRITER

Nicolo Giolitti, Ivrea, Italy, assignor to Remington Ind. E. Com. de Sistemas para Escritorio S. A., Rio de Janiero, Brazil

Filed Apr. 8, 1982, Ser. No. 366,565
Claims priority, application Italy, Apr. 27, 1981, 53179/81[U]
Int. Cl.³ B41J 35/28, 32/00
U.S. Cl. 400—208 8 Claims



1. A typewriter ribbon cartridge for a correcting typewriter having a means for advancing a correction ribbon, comprising:

(a) a housing defining first and second overlying volumes for containing a typewriter ribbon and a correction ribbon, respectively and an aperture which exposes a working length of the typewriter and correction ribbons, said first and second volumes being configured to support said typewriter and correction ribbons in overlying relationship to each other, said housing comprising:

(i) a bottom wall, positioned in said housing and rigidly positioned with respect to said housing at a position to separate said first and second volumes;

(ii) a first pair of sidewalls secured to said bottom wall in opposed relationship to each other, to define said first and second volumes, said second volume communicating with the outside, and said first sidewalls being positioned, configured and dimensioned to allow easy access to said second volume by a human operator, said first sidewalls being integral with said bottom wall, and said first volume being defined by the upper portion of said first sidewalls; and

(iii) a cover rigidly secured to the upper edges of said first sidewall to close said first volume;

(b) a typewriter ribbon contained within said first volume;

(c) first guiding means for guiding said typewritten ribbon through said aperture;

(d) second guiding means for guiding the correction ribbon disposed within said second volume;

(e) a pair of winding posts for supporting said correction ribbon;

(f) a winding mechanism, external to said second volume and for engaging said means for advancing the correction ribbon for closing at least a portion of said second volume; and

(g) said winding means including two toothed discs each of which is freely and rotatably mounted on one of said posts.

4,427,314

SPEED CONTROLLED PRINTER

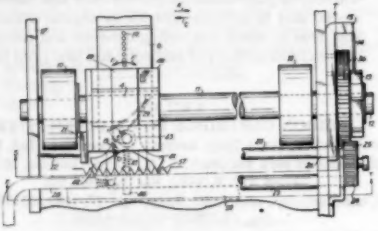
Hitoshi Fujiwara, and Kozo Kodaira, both of Shiojiri, Japan, assignors to Epson Corporation, Nagano and Kabushiki Kaisha Suwa Seikosha, Tokyo, both of, Japan

Filed Nov. 10, 1981, Ser. No. 320,047

Claims priority, application Japan, Nov. 11, 1980, 55-158724

Int. Cl.³ B41J *19/02, 3/36*

U.S. Cl. 400—338.2 **8 Claims**



1. A printer for printing on a recording paper, comprising:

printing head means, said printing head means being mounted for incremental translation relative to said paper for printing a line of characters thereon;

means for translating said printing head means for said printing;

speed control means cooperating with said printing head means, said speed control means controlling the speed of said incremental translation of said printing head means, said speed control means including teeth means and ankle means having at least two ankle pawls for alternate engagement with said teeth means, said incremental movement of said printing head means being caused by said alternate engagement of said ankle pawls with said teeth;

detection means mounted on said printing head means, said detection means providing a signal at each increment of movement of said printing head means for printing, said signals synchronizing actuation of said printing means with each incremental position of said printing head means, said detection means including a lever on and moving with said ankle means, and a detector, said detector detecting a pivoting motion of said lever and producing said signals each corresponding to an incremental movement;

printing means mounted on said printing head means and moving therewith, said printing means printing on said paper when said printing head means is moved for printing.

4,427,315

DEVICE FOR THE REMOVAL OF PAPER FROM BINDERS

Arthur Raisch, Hans-Sachs-Straase 8, 7250 Leonberg-Eltingen, Fed. Rep. of Germany

Filed Feb. 20, 1981, Ser. No. 236,617

Claims priority, application Fed. Rep. of Germany, Feb. 22, 1980, 3006606

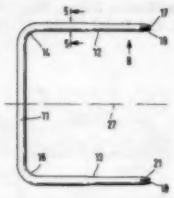
Int. Cl.³ B42F *3/00*

U.S. Cl. 402—80 R **17 Claims**

1. Device for the removal of sheets that have two circular marginal punched holes, from a binder which has flexible, thin prongs that have a flat shaped cross section and are bendable in an easy bending direction, comprising:

(a) an approximately U-shaped tubular handle having a tubular crosspiece and two tubular legs with free end regions, connected with one another by the crosspiece,

(b) in their free region, the largest cross-sectional dimension of the two legs is smaller than the diameter of the circular marginal punched holes,



(c) in the free ends of the legs a longitudinal recess is provided that is open to the outside, which is shaped so as to receive the free end regions of the prongs.

4,427,316

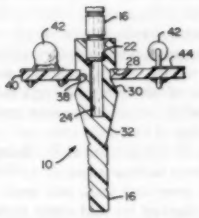
STACKING DEVICE FOR PRINTED CIRCUIT BOARDS

Jerry L. Moore, Harrisburg, and Attalee S. Taylor, Palmyra, both of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Jul. 14, 1982, Ser. No. 397,948

Int. Cl.³ F16B *1/00;* **F16D** *9/00*

U.S. Cl. 403—2 **4 Claims**



1. A device for use with printed circuit boards so that the boards may be stacked one above another, said device comprising an elongated body of resilient material and including:

a. an upper section adapted to extend above the board into which the device is mounted;

b. an intermediate section including a cylindrical portion at the upper end, a frustum defining the lower end with the convergence being downwardly, and an outwardly flaring portion therebetween,

c. an upwardly open hole extending downwardly into the elongated body; and

d. a cylindrical lower section having a number of breakaway segments in tandem, said lower section being adapted to be inserted into the upwardly open hole in a like device mounted on an underlying board.

4,427,317

EXPANDABLE CAMLOCK

John J. Wilhelm, New Kensington, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Sep. 18, 1978, Ser. No. 943,503

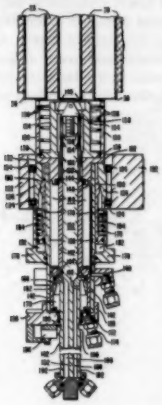
Int. Cl.³ F16B *2/14*

U.S. Cl. 403—31 **7 Claims**

1. An expandable camlock for supporting equipment from tubular members including a first member attached to said equipment, an elongated cylindrical second member slidably disposed within said first member and capable of relative motion with respect to said first member, a cap attached to the top end of said second member, a spacer slidably disposed on said second member between said cap and said first member, an

expandable first metal ring disposed on said second member between said spacer and said cap, and an expandable second metal ring disposed on said second member between said spacer and said first member, said metal rings comprising:

a metal ring having a substantially smooth outer surface and having a longitudinal slot extending the entire length of said ring and extending completely therethrough for allowing said ring to expand;



a plurality of longitudinal ribs on the inside of said ring for providing resiliency to said ring;

a first flat surface on one end of said ribs for preventing overexpansion of said rings; and

a first ramp extending from the outer surface of said ring to said first flat surface for expanding said ring into contact with said tubular member with said first flat surface preventing overexpansion of said ring.

4,427,318

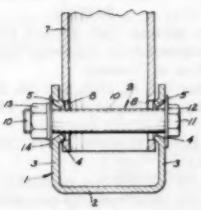
BOLTED JOINT CONNECTION

Elton G. Kaminski, Sidney, Ohio, assignor to The Stolle Corporation, Sidney, Ohio

Filed Jul. 16, 1982, Ser. No. 398,956

Int. Cl.³ F16B 7/18

U.S. Cl. 403—408 **3 Claims**



1. Joint means for connecting first and second metallic members, said first member comprising a U-shaped bracket having a lower web portion and flange portions extending from either end of the web portion, each of said flanges including an inwardly directed hollow boss with a bore extending axially therethrough, said second member comprising a hollow tube having a pair of opposed apertures extending through the side walls adjacent one end, said apertures being dimensioned slightly smaller than the maximum outside dimension of each said boss, each said boss being positioned to align with one of said apertures when said tube end is slip fitted between said flanges and being fitted partially within said aperture; bolt means including an elongated shank portion extending through each said bore and aperture; and means operatively connected to said bolt means for drawing said first and second members tightly together such that each said boss is forced into one of said apertures and urged against the second member and the outer surface of the bolt means shank to prevent relative movement between the first and second members, each said boss being configured to deform under pressure such that the outer surface of the boss makes metal-to-metal contact with the edge of one of the apertures and the inner surface of the boss make metal-to-metal contact with the shank.

4,427,319

LIFTING EQUIPMENT FOR AN OFFSHORE CONSTRUCTION

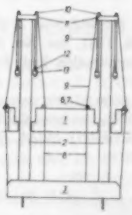
Heribert Mayr, Oberhausen, Fed. Rep. of Germany, assignor to Deutsche Babcock Anlagen Aktiengesellschaft, Oberhausen, Fed. Rep. of Germany

Filed Dec. 18, 1981, Ser. No. 331,969

Claims priority, application Fed. Rep. of Germany, Mar. 31, 1981, 3112702

Int. Cl.³ E02B 17/08

U.S. Cl. 405—196 **6 Claims**



1. Lifting equipment for an offshore construction of a floatable platform, comprising: raisable and lowerable support legs bearing on the sea bed; a floatable platform; at least two cable winches for each support leg arranged on the platform; one cable winch being connected through a single cable line with the lower end of a support leg, the other cable winch having a multiple cable line guided around two pulley blocks; one of said pulley blocks being arranged on the support leg; locking means; a ring surrounding said support leg and being detachably connected through said locking means with the platform; the other pulley block being arranged on said ring.

4,427,320

ARCTIC OFFSHORE PLATFORM

Dilipkumar N. Bhula, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed Feb. 19, 1982, Ser. No. 350,458

Int. Cl.³ E02B 17/00

U.S. Cl. 405—211 **6 Claims**

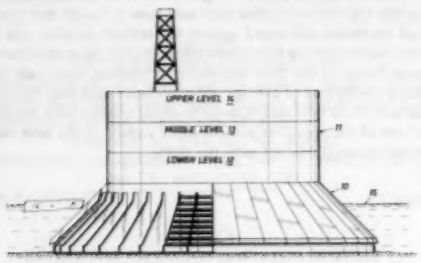
1. An offshore structure for use in arctic water containing moving ice masses comprising:

a frustum base section and a circular upper section, said base section having sufficient height to extend above the surface of the water;

the skin of said frustum section having a controlled stiffness cellular structure formed by an outer plate member and an inner plate member, said outer and inner plate members being separated by a series of radial and meridional webs fastened to said plates to form a cellular structure; and

a flexible beam structure, said beam structure being formed

by a series of circumferential beams supported by a series of radial bulkheads projecting upward from the bottom of



said frustum, said skin being attached to said flexible beam structure intermediate said radial bulkheads.

4,427,321

MINERAL MINING INSTALLATION

Walter Weirich, Dortmund; Harry Rosenberg, Ludinghausen, and Kunibert Becker, Werl, all of Fed. Rep. of Germany, assignors to Gewerkschaft Eisenhutte Westfalia, Lunen, Fed. Rep. of Germany

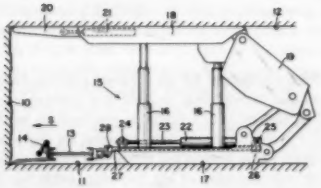
Division of Ser. No. 145,982, May 2, 1980. This application Sep. 28, 1981, Ser. No. 305,977

Claims priority, application Fed. Rep. of Germany, May 2, 1979, 2917609

The portion of the term of this patent subsequent to Dec. 29, 1998, has been disclaimed.

Int. Cl.³ E21D *15/14, 23/18, 23/26*

U.S. Cl. 405—294 **25 Claims**



1. A longwall mineral mining installation comprising a conveyor and a plurality of roof support units positioned side-by-side along the goaf side of the conveyor, the roof support units having a plurality of first and second double-acting hydraulic rams, each first hydraulic ram being associated with control means responsive to the movement of one of the second hydraulic rams, and each control means being such that the associated first hydraulic ram moves through a distance proportional to that through which the associated second hydraulic ram moves, wherein each control means is actuated by a respective sensing means which senses the movement of the associated second hydraulic ram.

4,427,322

CLAMPING ELEMENT FOR CUTTING TOOL

Augustin Kröll, Breitenwang, Austria, assignor to Schwarzkopf Development Corporation, New York, N.Y.

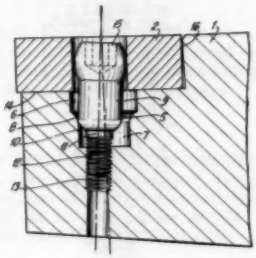
Filed Apr. 2, 1981, Ser. No. 250,285

Claims priority, application Austria, Apr. 4, 1980, 1880/80

Int. Cl.³ B26D *1/00*

U.S. Cl. 407—105 **3 Claims**

1. In a cutting tool comprising a body which is provided with a threaded borehole, a clamping bolt and a recess and is provided with a supporting surface and at least one lateral supporting surface for supporting an indexable cutting insert which is provided with a center hole for receiving said clamping bolt, said clamping bolt having a rotationally symmetrically shaped portion for engaging said center hole, an upper end having the form approximately of a clipped ball, a lower end screwable into said threaded borehole of the tool body and having the center portion thereof supported on said tool body, the improvement comprising providing said threaded borehole in said tool body in the zone adjacent to said recess with two coaxial, upper and lower cylindrical sections having different diameters and an axial direction extending perpendicular to the surface supporting the cutting insert, said upper cylindrical section tapered towards said lower cylindrical section by way of a tool body shoulder circularly curved in longitudinal section, said tool body shoulder extending without curved projec-



tion from said upper cylindrical section to the cylindrical surface of said lower cylindrical section; said clamping bolt having a bolt cylindrical section, a circularly curved bolt foot section and a bolt shoulder section and having a tapered circular curvature in longitudinal section between said bolt cylindrical section and said bolt foot section; said circularly curved bolt shoulder being adapted to contact said circularly curved tool body shoulder as said clamping bolt is tightened, the circular radii of said tool body shoulder and said bolt shoulder section each being in ratio of from 1:1 to 1:2.3 with respect to the radius of said bolt cylindrical section; and said lower cylindrical section of said borehole in said tool body having a lower zone provided with threading which is tilted from 2 to 7 degrees with respect to said axial direction away from the direction of said lateral supporting surface of said cutting insert.

4,427,323

DEVICE FOR MAKING TWO AXIALLY PARALLEL BORES

Hans Nielbock, Bottrop, Fed. Rep. of Germany, assignor to M.A.N. Maschinenfabrik Augsburg-Nürnberg Aktiengesellschaft, Fed. Rep. of Germany

Filed Jul. 20, 1981, Ser. No. 285,055

Claims priority, application Fed. Rep. of Germany, Sep. 17, 1980, 3035011

Int. Cl.³ B23B *35/00, 39/16;* **B23G** *1/20*

U.S. Cl. 408—42 **4 Claims**

1. A device for cutting two parallel partially intersecting bores substantially simultaneously comprising:

a device housing;

a pair of parallel spindles rotatably mounted on said device housing, each spindle having a gear fixed thereto with said gears meshed with each other, so that rotation of one spindle in one direction causes rotation of the other spindle in an opposite direction;

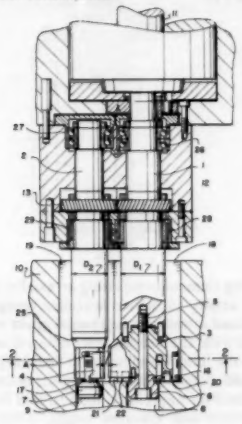
drive means connected to at least one of said spindles for rotating said one spindle in one direction, said drive means comprising a drive shaft connected to one of said spindles;

a tool holder connected to each spindle which is elongated in a direction substantially transverse to an axis of its associated spindle and along a major tool axis to form a substantially symmetrical pair of radially extending arms which have a cross sectional shape in a plane extending

transversely to the spindle axis which is rhomboidal to flat elliptical;

said tool holders connected to said spindles so that each major tool holder axis is always substantially perpendicular to the other major tool holder axis as said spindles rotate;

each tool holder having a central small diameter portion tapered in from an associated spindle so as to always maintain at least a minimum selected clearance with arms of the other tool holder; and



a plurality of cutting tools connected to the arms of said tool holder for cutting the two parallel partially intersecting bores substantially simultaneously, at least one cutting tool positioned on each tool holder for cutting a bottom of the parallel bores at a radius to overlap a path of the arms of the other tool holder and at least one additional cutting tool positioned on each tool holder for cutting side walls of the paralle bores.

4,427,324

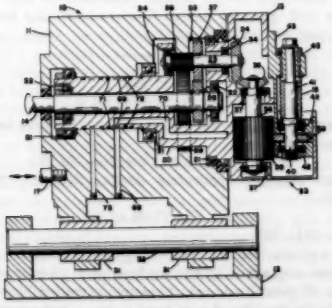
METHOD OF SHAPE GENERATION BY ORBITING A ROTATING HOB

George E. Fransson; Stuart J. Johnson, and Edward W. Haug, all of Rockford, Ill., assignors to Barber-Colman Company, Rockford, Ill.

Continuation of Ser. No. 41,680, May 23, 1979, abandoned. This application Aug. 30, 1982, Ser. No. 412,639

Int. Cl.³ B23F *5/22, 15/02*

U.S. Cl. 409—12 **8 Claims**



1. A method of generating a plurality of separate teeth of gears, splines or the like spaced about the periphery of a non-rotating workpiece having a lengthwise axis, utilizing a hob mounted for rotation and for orbital movement, and a planetary drive for rotating and for orbiting said hob, including a drive shaft, a planet gear and sun gear engaged with said planet gear, a drive mechanism coupling said drive shaft to rotate said planet gear and orbit said planet gear around said drive shaft by interaction of the planet and sun gears, and a mechanical drive coupling said planet gear to rotate said hob about its axis and to orbit said hob around said drive shaft, said method comprising the steps of:

positioning said workpiece, said hob and said planetary drive to align said workpiece axis and said drive shaft and to orient said hob eccentrically of and with its axis in a plane laterally displaced from and transverse to said workpiece axis;

rotating said drive shaft to rotate said hob and orbit said hob about said workpiece axis;

coordinating the rotary and orbital speeds of said hob according to a predetermined speed ratio established by said planetary drive such that for each orbit of said hob around said workpiece, said hob rotates a plurality of revolutions determined by the number of teeth spaced about the periphery and generated thereby; and

moving said hob and workpiece relatively lengthwise of said workpiece to engage said hob and said workpiece and generate on the periphery a plurality of separate teeth shapes which are conjugate to said hob during shape generation.

4,427,325

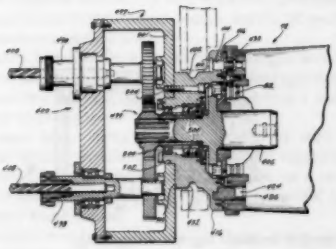
MULTIPLE SPINDLE TOOLHEAD

Ervin J. Kielma, West Allis; Albin J. Schabowski, Milwaukee, and John T. Currer, Wauwatosa, all of Wis., assignors to Kearney & Trecker Corporation, West Allis, Wis.

Division of Ser. No. 954,438, Oct. 25, 1978, Pat. No. 4,288,909. This application Apr. 1, 1981, Ser. No. 249,746

Int. Cl.³ B23B *39/16;* **B23C** *5/26;* **B23Q** *3/157*

U.S. Cl. 409—144 **2 Claims**



1. A multiple spindle toolhead having a housing and adapted to be removably mounted on a machine tool in position to be driven by the conventional spindle in the spindlehead of the machine tool;

at least one spindle journaled in said housing and extending forwardly therefrom for receiving a cutting tool to perform a machining operation;

drive means in said housing connected to transmit power for rotating said toolhead spindles;

coupling means extending from said housing for coupling said drive means to the machine tool spindle so that rotation of the spindle actuates said drive means for rotating said toolhead spindles;

a flange block coaxially secured to said housing and extending rearwardly therefrom to present an exposed face for engagement with the surface of the spindlehead;

means on said flange block for engagement by the grips of a

tool transfer mechanism to enable the toolhead to be transferred by a tool change mechanism;

a plurality of studs rigidly secured to said flange block to extend rearwardly therefrom, said studs being spaced from each other in conformance with the spacing of rotary nuts mounted on the spindlhead about the periphery of the spindle;

a pair of diametrically opposed flats formed on the end of each of said studs to produce diametrically opposed arcuate portions between said flats to enable said studs to enter an opening of like shape formed in each of said nuts;

threads formed on said arcuate portions for engagement with the threads formed in the nuts so that after the studs are moved into the respective openings in said nuts a partial turn of the nuts will engage the cooperating threads on the studs to draw the exposed face of said flange block tightly against the surface of the spindlehead frame to firmly support the toolhead in operating position;

and guide means on said flange block adapted to engage complementary guide means on the machine tool for accurately orientating the toolhead as it is being moved toward the machine tool spindle to insure alignment of the studs on the toolhead with the cooperating nuts on the machine tool.

4,427,326

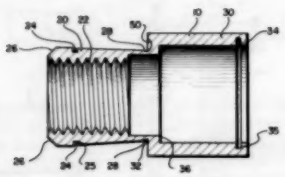
TAMPER-RESISTANT LUG NUT

Stephan C. Hobson, Buffalo Grove, and Kerry E. Stokes, Naperville, both of Ill., assignors to Image Industries, Inc., Wood Dale, Ill.

Filed May 11, 1982, Ser. No. 377,123

Int. Cl.³ F16B *41/00*

U.S. Cl. 411—5 **4 Claims**



1. A tamper-resistant lug nut comprising:

a first portion of generally cylindrical shape, said first portion having threads on interior surface, said threads being adapted to engage the threads of a standard stud, said first portion having an annular notch on the exterior surface thereof;

a second portion removably affixed coaxially to said first portion, said second portion having a generally hexagonal exterior and a generally cylindrical coaxial opening, the interior surface of said opening comprising an annular notch, said first portion being affixed to said second portion in a manner that upon application of an effective amount of torque the portions fracture and separate at the point of union, said second portion adapted to be reversed in attitude after separation and engaged over said first portions; and

a snap ring associated with said annular notches and adapted to cooperate with said notches to rotatably affix said second portion over said first portion.

4,427,327

ANCHOR BOLT INCLUDING ELONGATED SPREADER WEDGE

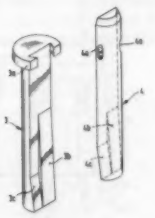
Armin Herb, Peissenberg, Fed. Rep. of Germany, assignor to Hilti Aktiengesellschaft, Liechtenstein

Filed May 13, 1981, Ser. No. 263,170

Claims priority, application Fed. Rep. of Germany, May 16, 1980, 3018875

Int. Cl.³ F16B *13/04*

U.S. Cl. 411—78 **6 Claims**



1. Fastening element comprising an axially elongated anchor bolt and an axially elongated spreader wedge each having a leading end and a trailing end spaced apart in the axial direction thereof with the leading end being inserted first into a borehole or the like into which said fastening element is to be anchored, said anchor bolt including means adjacent the trailing end thereof for applying a load to said fastening element, said anchor bolt and spreader wedge when inserted into a borehole have an unspread condition and a spread condition, in the unspread condition the leading ends of said anchor bolt and spreader wedge are spaced axially apart and the circumferential peripheral surface of said anchor bolt and spreader wedge combine to define a circular cross-section, said anchor bolt having a wedge surface extending in the axial direction thereof, said fastening element commences to be spread as said spreader wedge moves axially relative to said anchor bolt from the unspread condition with the leading end thereof approaching the leading end of said anchor bolt and with said spreader wedge sliding over the wedge surface of said anchor bolt, and with the circumferential peripheral surfaces of the combined said anchor bolt and spreader wedge departing from a circular cross-section, and said wedge surface is divided into at least a first wedge surface part and a second wedge surface part with said first and second parts each having a different slope angle relative to the axis of said anchor bolt, said first and second wedge surfaces located on the exterior surface of said anchor bolt and each commencing at a different axial dimension from the trailing end of said anchor bolt, said first wedge surface part having a smaller slope angle than said second wedge surface part and as said spreader wedge moves from the unspread condition to the spread condition of said fastening element said spreader wedge first contacts said first wedge surface part of said anchor bolt.

4,427,328

PLASTIC FASTENER

Masaharu Kojima, Toyota, Japan, assignor to Nifco Inc., Yokohama, Japan

Filed Sep. 2, 1981, Ser. No. 298,683

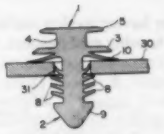
Claims priority, application Japan, Sep. 22, 1980, 55-133656[U]

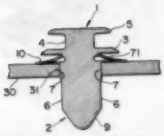
Int. Cl.³ F16B *19/02*

U.S. Cl. 411—508 **1 Claim**

1. In a plastic fastener comprising a head portion adapted to come into contact with one surface of a given panel, a leg portion of predetermined diameter extended downwardly from the lower side of said head portion and adapted to be inserted through a fitting hole bored in advance in said panel, and a multiplicity of engaging projections of greater transverse

dimension than said predetermined diameter disposed in stepped manner on said leg portion at regular intervals in the direction of the length of the leg portion, the improved plastic fastener comprising at least two guide ridges radially protruded in opposite directions from said leg portion along the length of the leg portion, said projections being joined to said





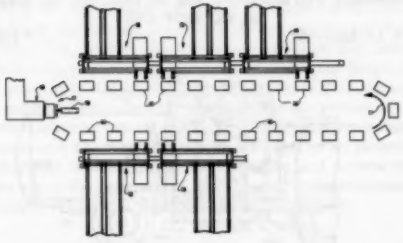
leg portion and to said guide ridge, of predetermined thickness and provided at the terminal edges thereof with engaging ridges of a small thickness relative to said predetermined thickness, said engaging projections being disposed on the leg portion devoid of said guide ridges, and said engaging projections being disposed so as to be slanted toward the head portion.

4,427,329

MONORAIL JIG BOX LOADER

Harold J. Milholen, Siler City, N.C., assignor to Pearne and Lacy Machine Co., Inc., Siler City, N.C.

Filed Aug. 31, 1981, Ser. No. 298,264
Int. Cl.³ B65G *57/10*
U.S. Cl. 414—68 **12 Claims**



1. An apparatus for stacking brick in jig boxes or the like, comprising a plurality of loading stations to which said jig boxes are sequentially moved, a transfer at each loading station, brick handling means associated with each transfer operable to position a layer of brick on each transfer sized to provide a full layer of brick in said jig box, said transfers sequentially operating to deposit said layers in jig boxes as they move to said loading stations until said jig boxes are loaded, each transfer including a transfer tray movable between a retracted position and an extended position, said trays receiving said layers in said retracted position and extending into said jig boxes in said extended position, and stripper means operable to hold said layers in said jig boxes as said trays return to said retracted position, said trays providing locating means positioned on the forward end thereof operable to laterally position said jig boxes with respect to said trays as said trays move toward said extended position before a layer of brick carried by said trays enters said jig boxes said trays moving said brick a portion of the way into said jig boxes, and said stripper means operating to move said brick through a remaining portion of the way into said jig boxes

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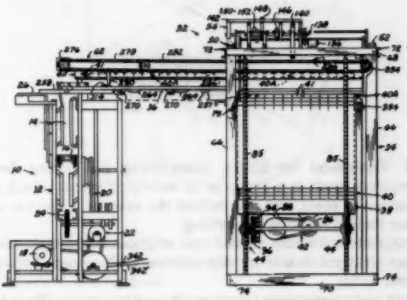
4,427,330

AUTOMATIC FENCE PICKET STOCK CONVEYOR FOR FENCE PICKET POINTING MACHINE

Charles P. Carter, 301 SW. 46, Oklahoma City, Okla. 73109

Continuation-in-part of Ser. No. 239,965, Mar. 3, 1981, Pat. No. 4,387,751. This application Oct. 13, 1981, Ser. No. 310,024
Int. Cl.³ B65G *59/02*
U.S. Cl. 414—113 **10 Claims**



1. In a conveyor for sequentially moving a plurality of elongated workpieces from a workpiece bundle to the throat of an upstanding workpiece processing machine having at least one laterally projecting longitudinally reciprocating pitman, at its upper limit, said workpiece bundle comprising a plurality of superposed horizontal layers of juxtaposed elongated workpieces, the improvement comprising:

upright bundle frame means including a motor driven platform disposed laterally of said workpiece processing machine for receiving and elevating a bundle of workpieces a predetermined distance;

stationary frame means extending horizontally between the upper limit of said bundle frame means and said workpiece processing machine for normally supporting a workpiece layer when deposited thereon;

workpiece layer lifting means supported by said bundle frame means for lifting and horizontally supporting the topmost layer of said workpiece bundle, as a unit, in a plane spaced above said workpiece bundle and said stationary frame means;

cam means overlying said bundle frame means and connected with said workpiece layer lifting means for operating said workpiece layer lifting means in response to said bundle frame means elevating said workpiece bundle said predetermined distance;

drag chain means overlying said stationary frame means and extending into said bundle frame means for moving said horizontally supported workpiece layer laterally to an overlying position with respect to said stationary frame means; and,

movable frame means within and supported by said stationary frame means and connected with said reciprocating pitman for reciprocating movement between said bundle frame means and said workpiece processing machine and lifting an overlying workpiece layer relative to said stationary frame means and moving said overlying workpiece layer laterally a distance equal to the transverse width of each workpiece of the workpiece layer during each movement toward the workpiece processing machine.

4,427,331
EQUIPMENT FOR LIFTING, TRANSPORTING AND SETTING DOWN ELONGATE GOODS

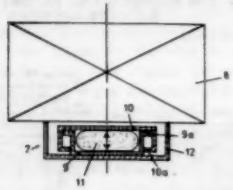
Hermann Grebenstein, Unter-Erlinsbach, and Jorge Speich, Thalheim, both of Switzerland, assignors to Oehler-Wyhlen-Lagertechnik AG, Buchs bei Aarau, Switzerland

Filed Aug. 31, 1978, Ser. No. 938,703

Claims priority, application Fed. Rep. of Germany, Aug. 31, 1977, 2739130; Nov. 11, 1977, 2749414

Int. Cl.³ B65G *65/00*

U.S. Cl. 414—277 **4 Claims**



1. Equipment for lifting, transporting and setting down elongated goods in a group or as individual pieces which are arranged in rows, one row behind the other in a narrow and space limited location comprising:

storage racks for each of said row of goods and pieces which are arranged in side by side relation with a space between said racks;

lifting and transporting means positioned longitudinally in said space between said storage racks which include a plurality of hingedly connected shifting elements to raise the goods or piece, shifting goods and lower the goods or piece and while supporting the goods during these operations;

driving means including a driving roller and a roller chain which move the shifting elements of said lifting and transporting means in either direction which is transverse to said racks so that the goods move to or away from either rack;

each said shifting element comprising a first lower U profiled member, a second upper U profiled member slightly larger in width than said first member to form a displaceable cap thereover and an expansible swelling member which lifts the load of said goods from lower member to transfer the goods to said upper member which provides support during movement of said shifting element to or away from said rack;

a pair of rollers below said shifting element to facilitate movement of said shifting element to or away from said rack;

a tongue projection for said roller chain which engages said plurality of shifting elements after inflation of said expansible swelling member.

a lifting table for mounting the plurality of hingedly connected shifting elements of said lifting and transporting means; and

pneumatic means to inflate and to deflate said expansible swelling member.

4,427,332
INTEGRATED CIRCUIT WAFER TRANSPORT MECHANISM

Ralph F. Manriquez, Saratoga, Calif., assignor to Nanometrics, Incorporated, Sunnyvale, Calif.

Filed Feb. 26, 1982, Ser. No. 352,752

Int. Cl.³ G01N *21/01, 35/00*

U.S. Cl. 414—331 **11 Claims**

1. In the production of intergrated electronic circuits, a transport mechanism for transferring circuit wafers between a disc holder and a predetermined point, said transport mechanism comprising:

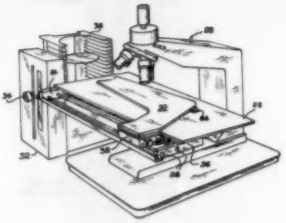
elevator means for supporting and vertically adjusting the height of the disc holder in steps corresponding to the spacing of adjacent horizontally placed wafers in said disc holder;

guide means linearly extending parallel with, but displaced from a line between said disc holder and the predetermined point;

a housing coupled to and slidably movable along said guide means, said housing having a vertically movable roof member;

lifting means within said housing for moving said roof member between first and second predetermined vertical positions; and

a transport arm having its first end attached to the top surface of said housing roof member, the second end of said



arm being substantially centered along said line between said disc holder and said predetermined point, said second end being dimensioned for insertion into a disc holder on said elevator means and between adjacent wafers in said disc holder without contacting either of said wafers when said roof member is in its first vertical position, and for lifting the upper one of said adjacent wafers out of contact with said disc holder when said roof member is in its second vertical position, whereby said upper wafer may be transported to said predetermined point by movement of said housing along said guide means.

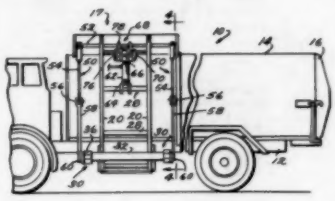
4,427,333
LOADER FOR A VEHICLE BODY

Franklin D. Ebeling, P.O. Box 1925, Plainview, Tex. 79072

Continuation-in-part of Ser. No. 239,581, Mar. 2, 1981, abandoned. This application Aug. 25, 1981, Ser. No. 296,007

Int. Cl.³ B65F *3/08*

U.S. Cl. 414—409 **7 Claims**



1. In apparatus for attachment to a vehicle for raising and lowering a container relative to the vehicle and for tipping the container when in a raised position so as to dump the contents of the container into the body of the vehicle, said apparatus being of the kind having an upright mast assembly and container engaging means arranged on said mast assembly for guided vertical movement relative thereto, an improved mechanism for raising and lowering said container engaging means comprising: an articulated arm assembly having a lower end pivoted to said container engaging means for rotation about a first horizontal axis and an upper end mounted for swinging movement about a second horizontal axis; and means for swinging said arm assembly about said second axis, said axes being parallel and arranged such that the members of the arm assembly swing in a vertical plane which is transverse to the axis of the vehicle, upward swinging movement of said assem-

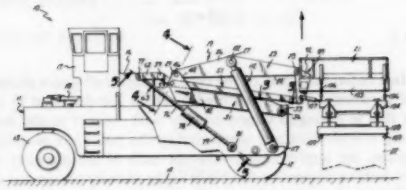
bly raising said container engaging means upwardly along said mast assembly and tipping said container engaging means in a mode to dump the contents of a container engaged by said container engaging means at the upper end of said path and downward swinging movement of said assembly tipping said container engaging means in an opposite mode and moving said container engaging means downwardly along said mast assembly.

4,427,334

LOAD HANDLING APPARATUS

Fernand Copie, Minneapolis; Warren E. Esterberg, Plymouth, both of Minn.; Quentin K. Fadness, Boring; Howard A. Stewart, Portland, both of Oreg., and Robert J. Ringwelski, Maple Grove, Minn., assignors to RayGo, Inc., Minneapolis, Minn.

Filed Feb. 17, 1982, Ser. No. 349,182
Int. Cl.³ E02F *3/70*
U.S. Cl. 414—710 **29 Claims**



1. A load handling apparatus comprising: a support, a main lift beam located above the support and extended in a generally longitudinal direction, said lift beam having a forward end and a rear end, first link means having a lower end pivotally connected to the support and an upper end pivotally connected to the rear end of the lift beam, control beam means having a forward end and a rear end located generally parallel to said lift beam, pivot means pivotally connecting an intermediate portion of the control beam means to the first link means adjacent the upper end thereof, second link means pivotally connected to the support and rear end of the control beam means, third link means pivotally connected to the forward ends of the lift beam and control beam means, said third link means adapted to be connected to a load lifting means, and longitudinally extendible and contractible means mounted on the support and pivotally connected to an intermediate portion of the lift beam whereby extension of the extendible and contractible means moves the outer end of the lift beam to an extended position and contraction of the extendible and contractible means moves the outer end of the lift beam from the extended position to a retracted position adjacent the support.

4,427,335

Patent Not Issued For This Number

4,427,336

SINGLE VANE ROTODYNAMIC IMPELLER

Geoffrey G. Lake, 29 Wallingford Rd., Wallingford, Cholsey, Oxfordshire, England

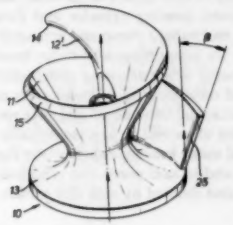
PCT No. PCT/GB79/00195, § 371 Date Jun. 18, 1980, § 102(e) Date Jun. 18, 1980, PCT Pub. No. WO80/01095, PCT Pub. Date May 29, 1980
PCT Filed Nov. 16, 1979, Ser. No. 198,070
Claims priority, application United Kingdom, Nov. 17, 1978, 45068/78
Int. Cl.³ F04C *1/04, 3/02*
U.S. Cl. 415—71 **11 Claims**

1. A rotodynamic impeller for a pump suitable for pumping liquids having entrained solid matter which comprises:

a flared core;

a single spiral vane encircling said flared core, the vane twisting by reduction of a radius angle thereof from a substantially axial inlet configuration to a substantially centrifugal outlet configuration, wherein

the inlet configuration further comprises an inlet edge extending upstream and radially outwardly from the core at the axis thereof, the inlet edge being curved so as to increase the axial component thereof as it approaches the core such that, in operation in said pump, said solid matter



impinging on the inlet edge will be swept inwardly along the edge and thence through the impeller to the outlet thereof, and wherein

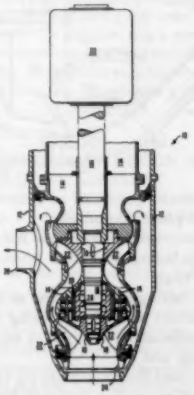
the outlet configuration is such that the radius angle of the vane at the outlet is less than 30°, the subtended angle thereof is less than 22½°, and the vane has a positive outlet angle which is in the range of 5° to 15°.

4,427,337

BEARING FOR LIQUID METAL PUMP

Robert J. Dickinson, Shaler Township, Allegheny County; John Wasko, Plum Borough, and William E. Pennell, Unity Township, Allegheny County, all of Pa., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Feb. 17, 1981, Ser. No. 235,209
Int. Cl.³ F01D *11/00*
U.S. Cl. 415—113 **3 Claims**



1. A liquid metal pump comprising:

a rotatable pump shaft;

an inner bearing cylinder disposed around and attached to said pump shaft;

an outer bearing cylinder disposed around said inner bearing cylinder for supporting and allowing rotation of said inner bearing cylinder and said pump shaft, with said outer bearing cylinder having a first land and a second land mounted thereon and adjacent to said inner bearing cylinder defining a bearing pocket therebetween and with said outer bearing cylinder having a hole therein for allowing liquid metal to flow into said bearing pocket and between said first land and said inner bearing cylinder and between said second land and said inner bearing cylinder for preventing contact of said inner bearing cylinder and said lands when said pump is operating;

a plurality of first spokes tangentially attached at one end to said outer bearing cylinder and fixedly attached at the other end to said pump and arranged in substantially one plane for supporting said outer bearing cylinder within said pump while allowing differential thermal expansion of said outer bearing cylinder with respect to said pump by horizontal bending of said first spokes; and

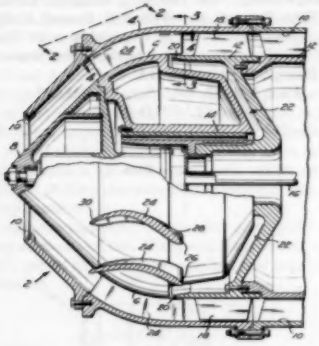
a plurality of second spokes tangentially attached at one end to said outer bearing cylinder and rigidly attached at the other end to said pump and arranged in a plane different from that defined by said first spokes.

4,427,338

THRUST CONTROL VANES FOR WATERJETS

Raymond B. Furst, Northridge, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Continuation of Ser. No. 164,416, Jun. 30, 1980, abandoned.
This application Jun. 4, 1982, Ser. No. 385,156
Int. Cl.³ F04D *29/54*
U.S. Cl. 415—210 **2 Claims**



1. A waterjet pump comprising:

a housing comprising fixed means for defining a fluid passageway including an interior portion having a forward peripheral edge;

a rotor drum having an aft end and an impeller blade means formed thereon said aft end being axially spaced apart from and substantially coaxial to said peripheral edge of said housing; and

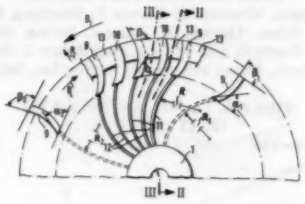
a plurality of fixed flow-straightening vanes mounted to said housing and projecting into said fluid passageway, said vanes having blunted leading edges located over said aft end of said rotor drum and said vanes having a thickness adjacent to the leading edge of said vanes greater than a thickness adjacent the trailing edge of said vanes.

4,427,339

RADIAL FANWHEELS

Karlheinz Witzel, Stuttgart, Fed. Rep. of Germany, assignor to Suddeutsche Kuhlerfabrik Julius Fr. Behr GmbH & Co. KG, Fed. Rep. of Germany

Filed Dec. 23, 1981, Ser. No. 333,977
Claims priority, application Fed. Rep. of Germany, Dec. 31, 1980, 3049596; May 14, 1981, 3119096
Int. Cl.³ F01D *5/00*
U.S. Cl. 416—131 **12 Claims**



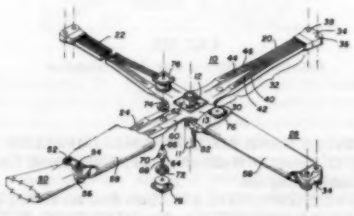
1. In a radial fanwheel of the type having a hub and a plurality of forwardly bowed fan blades which are disposed in an array that is arranged concentrically with respect to the hub forming a blade ring and connected to the hub via a plurality of spokes, the improvement wherein each of the plurality of spokes holds a respective fan blade in the vicinity of one end of the blade and is curved in a direction generally oppositely relative to the respective forwardly bowed fan blade; wherein circumferentially adjacent spokes are arranged relative to a radially extending center plane of the fanwheel and extend radially outwardly from the hub while diverging from said plane; and wherein each fan blade is connected at one end with a fan blade located forwardly of it in a circumferential direction and at an opposite end to a fan blade located rearwardly of it in a circumferential direction by respective connecting elements.

4,427,340

SOFT INPLANE BEARINGLESS HELICOPTER ROTOR

Robert W. Metzger, Hurst; William D. Neathery, Fort Worth; Peter A. Reyes, Watauga; Patrick R. Tisdale, Bedford; Cecil E. Covington, Hurst, and Willem Broekhuizen, Arlington, all of Tex., assignors to Bell Helicopter Textron Inc., Forth Worth, Tex.

Filed Jun. 24, 1982, Ser. No. 373,525
Int. Cl.³ B64C *27/38*
U.S. Cl. 416—141 **13 Claims**



1. A soft inplane bearingless rotor to be rigidly mounted on a helicopter mast comprising:

(a) a unitary yoke having a flat hub section adapted to be anchored to the end of said mast and having diametrically opposed blade-supporting arms extending from said hub section, each arm having a thin flapping section adjacent said hub section and a feathering section extending from

said flapping section with blade attachments at the end of each of said arms, said arms including a plurality of fiber reinforced composite parallel ribs extending span-wise with predetermined inplane spacing;

(b) a blade secured to each attachment with a cuff extending inboard to said flapping section; and

(c) bearing structure interconnecting the inboard end of said cuff and said flapping section and including inplane resilient structure for soft inplane restraint of said blade.

4,427,341
SIDE PROPELLERS FOR THE PROPULSION OF FAST BOATS AND AIRCRAFT

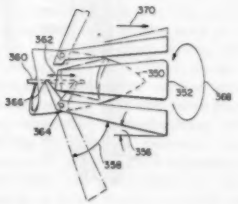
Horst Eichler, Auf dem Sande 12, 54-Koblenz-Pfaffendorf, Fed. Rep. of Germany

Division of Ser. No. 913,801, Jun. 8, 1978, Pat. No. 4,253,799, which is a division of Ser. No. 690,275, May 26, 1976, Pat. No. 4,130,378. This application Jan. 6, 1981, Ser. No. 222,930

Claims priority, application Fed. Rep. of Germany, May 26, 1975, 2523180

Int. Cl.³ B64C *11/28*

U.S. Cl. 416—142 **1 Claim**



1. A propeller for providing forward thrust to a body traveling at relatively high speed through a surrounding fluid medium, comprising:

(a) a propeller hub having an axis of rotation;

(b) a plurality of airfoil surfaces mounted to and distributed radially about said hub;the position of each said airfoil surface being defined by first and second pitch angles, respectively, said first pitch angle being the angle in the rotation direction between the profile longitudinal axis of said airfoil surface and a tangent on the circular arc described by the rotation of said airfoil surface about said propeller hub, and said second pitch angle being the angle between the profile transversal axis of said airfoil surface and said axis of rotation;

(c) each airfoil surface having a pivot connection in the region of said hub so that said airfoil surfaces are pivotable about said pivot connections between, on the one hand, an outwardly unfolded condition in which said blades are at a relatively large angle with respect to the hub axis and in which outer ends of said airfoil surfaces are disposed at relatively great distances from the hub axis and, on the other hand, an inwardly folded condition in which said airfoil surfaces are at a relatively small angle with respect to said hub axis and in which said outer ends of said airfoil surfaces are disposed at a relatively small distance from the hub axis;

(d) said second pitch angle being relatively large when said airfoil surfaces are in their outwardly unfolded condition, said second pitch angle being relatively small when said airfoil surfaces are in their inwardly folded condition;

(e) means for modifying said second pitch angle while said propeller is rotating by opening and folding the propeller by pivoting each airfoil surface, whereby said propeller will operate predominately as a conventional screw-type propeller for operation at low traveling speed through said fluid medium when said second pitch angle is large, and said propeller will provide greater efficiency at high traveling speeds than a conventional screw-type propeller when said second pitch angle is relatively small.

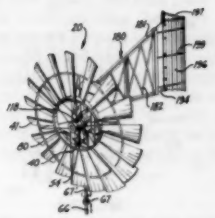
4,427,342
STRAIGHT LINE DRIVE MECHANISM DRIVABLE BY WIND OR OTHER POWER SOURCE

Richard K. Sutz, Scottsdale, and Louis J. Grunwald, Sun City, both of Ariz., assignors to Wind Baron Corporation, Phoenix, Ariz.

Filed Oct. 15, 1981, Ser. No. 311,514

Int. Cl.³ F01D *25/00*; F03D *11/00*

U.S. Cl. 416—170 R **7 Claims**



1. A gearless straight line drive mechanism drivable by a power source for operating a pump or the like, comprising:

a support;

a rotatable first shaft carried by said support and drivable by said power source;

a crank arm secured to said shaft and rotated thereby;

a connecting rod pivotally connected to said crank arm and reciprocated thereby up and down while said shaft rotates;

an axially horizontal second shaft carried by said connecting rod and reciprocated thereby up and down;

an axially vertical member secured to said second shaft and reciprocated thereby for operating said pump;

a flat, elongated, symmetrical link secured at its center to said second shaft and disposed in a first vertical plane;

a pair of guide arms pivotally carried by said support and arranged to pivot in a second vertical plane parallel to said first vertical plane, opposite ends of said link being pivotally secured to said guide arms respectively to turn in opposite directions in said first vertical plane, while said center of said link reciprocates in a precisely vertical direction, and said link and said guide arms constrain said second shaft to move up and down in a precisely vertical path while said connecting rod reciprocates said second shaft up and down, so that said member reciprocates in a precisely vertical direction for operating said pump.

4,427,343
EFFICIENT WIND TURBINE DESIGN FOR LOW VELOCITY AIR FLOW

George Fosdick, 14 Wellington Dr., Stony Brook, N.Y. 11790

Filed Sep. 27, 1982, Ser. No. 424,743

Int. Cl.³ F03D *1/06*

U.S. Cl. 416—200 A **8 Claims**

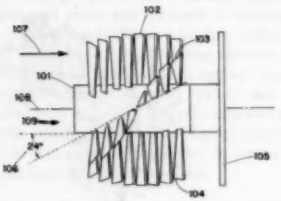
1. A wind turbine of the type having a hub aligned and arranged to rotate about a horizontal axis, the turbine having a forward and a rear face with the forward face being at the hub terminal which is directed into the wind during normal operation of the turbine, wherein the invention comprises:

(a) a cylindrical member positioned concentrically about but spaced apart from the hub, the diameter of the cylindrical member being nominally one-third the overall rotor diameter as measured from diametrically opposite blade tip to blade tip,

(b) mounting means for supporting and connecting the cylindrical member to the hub, said mounting means oriented

and arranged to permit the flow of air through the cylindrical means, and

(c) a plurality of blades that originate at and are mounted to the outside surface of the cylindrical member and extend radially therefrom, the blades being arranged in a plurality of rows exceeding four but less than ten in number with each row comprising a plurality of blades exceeding 20 in number, and each row extending spirally about the cylindrical member, winding in the direction of normal rotation of the wind turbine in traversing the cylindrical member from forward to rear, each of the blades having a mean



width and the blades being nominally separated in the axial direction of the cylindrical member by their mean width, the rows of blades providing frontal coverage of 300 to 360 degrees without overlap of the rows with each row being oriented to form an angle of nominally 24 degrees with the axis of rotation, the rows of blades being evenly distributed around the cylindrical member, and the angle of nominally 24 degrees, the 300 to 360 degree coverage, the number of blades and their spacing causing the cylindrical member to have a length in its axial direction exceeding twenty-five percent of the diameter from diametrically opposed blade tip to blade tip.

4,427,344

HELICOPTER ROTOR BLADE

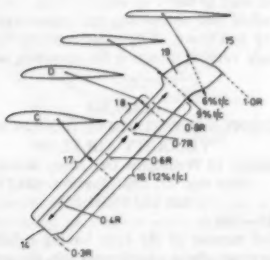
Frederick J. Perry, Sherborne, England, assignor to Westland Aircraft, Ltd., Yeovil, England

Filed Mar. 13, 1981, Ser. No. 243,498

Claims priority, application United Kingdom, Mar. 28, 1980, 8010639

Int. Cl.³ B64C *27/46*

U.S. Cl. 416—223 R **13 Claims**



1. A helicopter rotor blade having a root end for attachment to a rotor head, a tip end defining the end of the blade furthest from the root end, and a central portion of aerofoil section extending between and attached to the root end and the tip end, wherein an outboard region of the central portion has a negative basic pitching moment coefficient of absolute value not less than 0.02 and an inboard region has a basic pitching moment coefficient more positive than that of the outboard region.

4,427,345

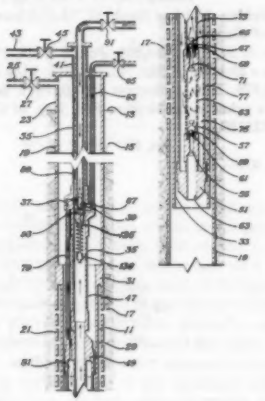
ARTIFICIAL LIFTING DEVICE AND METHOD

Jack R. Blann; Robert C. West, both of Houston, and Bolling A. Abercrombie, Montgomery, all of Tex., assignors to Hughes Tool Company, Houston, Tex.

Filed Oct. 26, 1981, Ser. No. 314,915

Int. Cl.³ F04F *1/06*

U.S. Cl. 417—54 **14 Claims**



1. An artificial lifting device for flowing hydrocarbons from a well bore to the earth's surface comprising:

an external cylindrical member adapted to be supported in said well bore from the surface, said member having an injection port and a vent port in the sides thereof;

an internal cylindrical housing mounted within said external cylindrical member to provide an annular area between said external cylindrical member and said housing;

gas valve means supported within said housing and connected by a tubing string running to the surface with a source of pressurized gas, said gas valve means having an inlet end through which pressurized gas is communicated as said gas is supplied through said tubing string;

passage means within the device communicating said gas valve inlet end with said injection port and vent port respectively;

reciprocating means in said valve means reciprocable between an injection position, whereby said valve inlet end communicates with said injection port when pressurized gas is supplied through said tubing string from the surface while said vent port is closed, and a vent position whereby said injection port communicates with said vent port while said gas valve inlet end is closed;

an exhaust conduit separate from said gas valve inlet end communicating said vent port with the surface when said reciprocating means is in said vent position; and

a lower sub connected to said cylindrical member having an internal bore which communicates hydrocarbons from the well to said annular area between said external cylindrical member and said housing when gas is supplied through said gas valve inlet end to said injection port to promote the lifting of hydrocarbons below the gas valve means upwardly through said annular area and cylindrical member to the well surface.

4,427,346

MOTOR-DRIVEN RECIPROCATING PISTON COMPRESSOR, PARTICULARLY FOR HERMETICALLY ENCAPSULATED SMALL REFRIGERATORS

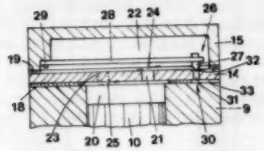
Bendt W. Romer, Hjortevej, Denmark, assignor to Danfoss A/S, Nordborg, Denmark

Filed Mar. 10, 1982, Ser. No. 356,838

Claims priority, application Fed. Rep. of Germany, Mar. 21, 1981, 3111253

Int. Cl.³ F04B 49/02

U.S. Cl. 417—292 1 Claim



1. A motor-driven reciprocating piston compressor for hermetically encapsulated small refrigerators, comprising, a housing forming a cylinder chamber, a piston in said cylinder chamber, a valve plate and an interposed sealing plate at one end of said cylinder chamber, said valve plate having suction and pressure bores communicating with said cylinder chamber, said bores being closed by respective suction and pressure valves, a cylinder cover forming with said valve plate a cover chamber, a throttling connecting passage passing through said valve plate, said sealing plate having a cut-out aligned with said connecting passage to provide fluid communication between said cover chamber and the exterior of said cylinder cover and said housing, a valve element for said connecting passage, temperature responsive bimetal actuating means in said cover chamber connected to and controlling said valve element to close said connecting passage when the temperature of a gas in said cover chamber exceeds a predetermined value, said bimetal element being a strip extending parallel to said valve plate and being mounted in and to said cover chamber at one end thereof and carries said valve element at the other end thereof, said compressor being mounted in a capsule which is at suction pressure, and said actuating means being designed to close said connecting passage at about 80 to 100 degrees centigrade.

4,427,347

FUEL INJECTION PUMP FOR INTERNAL COMBUSTION ENGINES

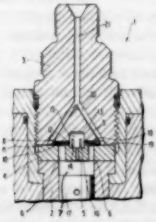
Ulrich Augustin, Kernen, Fed. Rep. of Germany, assignor to Daimler-Benz A.G., Fed. Rep. of Germany

Filed Dec. 8, 1980, Ser. No. 214,416

Claims priority, application Fed. Rep. of Germany, Dec. 6, 1979, 2949014

Int. Cl.³ F04B 49/00

U.S. Cl. 417—296 10 Claims



1. A fuel injection pump for an internal combustion engine, the fuel injection pump including a pump cylinder, a valve holder, means provided in the valve holder for communicating the valve holder with a fuel injection line, and a dual-acting check valve means arranged between the pump cylinder and the valve holder, the dual-acting check valve means including a resilient valve disk means having a central passage therein for deforming to convey fuel to the fuel injection line and for conforming to the surface of the base plate from the edge of the valve disk means contiguous to the central passage to the outer dimension of the valve disk means when the valve disk means is open in a direction opposite to the fuel conveying direction, characterized in that

a base plate is interposed between the pump cylinder and the resilient valve disk means, the base plate includes inlet bore means for communicating the pump cylinder with the communicating means in the valve holder, and a throttle means arranged between the pump cylinder and the valve holder and acting in a direction opposite to a fuel conveying direction of the injection pump, and in that the base plate forms an abutment for the valve disk means of the check valve means when the check valve means opens in a direction opposite the fuel conveying direction.

4,427,348

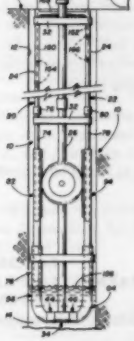
DUPLEX HYDRAULIC AND AIR OIL WELL PUMP

William M. Kofahl, Licking, Mo., assignor to Flying K Equipment System, Inc., Licking, Mo.

Filed May 18, 1981, Ser. No. 264,450

Int. Cl.³ F04B 35/02, 21/00

U.S. Cl. 417—342 9 Claims



1. A pump for pumping a fluid from a first elevation to a higher, second elevation, said pump comprising:

first and second pumping strings for extension adjacent the first elevation for carrying a pumping fluid;

a return string for extension between the first and second elevations for carrying the fluid to the second elevation;

first and second hydraulic pistons slideably mounted on said first and second pumping strings, respectively, for reciprocating motion between extended and retracted positions;

a hydraulic pumping fluid disposed in said first and second pumping strings in hydraulic contact with said first and second hydraulic piston to apply hydrostatic pressure thereto;

a first pumping cylinder secured in a fixed relation to said first pumping string, said first piston extending into said first cylinder to define a first pumping chamber, the volume of the first pumping chamber varying as said first

piston reciprocates, the first pumping chamber being interconnected with said return string;

first inlet valve means for permitting fluid at the first elevation to enter the first pumping chamber;

a second pumping cylinder secured in a fixed relation to said second pumping string, said second piston extending into said second cylinder to define a second pumping chamber, the volume of said second pumping chamber varying as said second piston reciprocates, the second pumping chamber being interconnected with said return string;

second inlet valve means for permitting fluid at the first elevation to enter the second pumping chamber;

standing valve means positioned in said return string permitting fluid flow therethrough only toward the second elevation;

valve means to prevent flow of fluid between said first and second pumping chambers;

gear means interconnecting said first and second pistons so that motion in one of said pistons toward the extended position directly induces a corresponding opposite motion in the other said piston to the retracted position;

means for reciprocating said first and second pistons by decreasing the hydrostatic pressure applied to one of said first and second pistons and simultaneously increasing the hydrostatic pressure to the other of said first and second pistons, said reciprocating means alternating the increase and decrease of hydrostatic pressure between said first and second pistons; and

said gear means directly translating reciprocal motion of one of said first and second pistons to the other one thereof in the opposite reciprocating direction, retraction of one of said first and second pistons causing the respective one of said first and second inlet valve means, respectively, to open, permitting fluid to flow into the respective one of said first and second pumping chambers at the first elevation, extension of the other of said first and second pistons causing the fluid contained in the respective one of said first and second pumpingchambers to flow through said standing valve means.

4,427,349

REFRIGERATION COMPRESSOR SUSPENSION SYSTEM

John P. Elson, Sidney, Ohio, assignor to Copeland Corporation, Sidney, Ohio

Continuation of Ser. No. 61,287, Jul. 27, 1979, abandoned, which is a division of Ser. No. 767,385, Feb. 10, 1977, Pat. No. 4,174,189. This application Aug. 31, 1981, Ser. No. 298,265

Int. Cl.³ F04B *35/04*

U.S. Cl. 417—363 **9 Claims**

1. A suspension system for a hermetic compressor comprising:

a hermetically sealed shell;

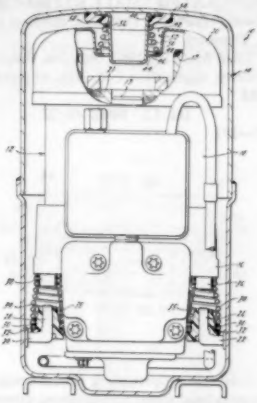
compressor means including a driving motor disposed within said shell;

a shroud enclosing one end of said motor;

a pair of spaced vertically extending supporting arms secured to sidewall portions of said shell;

a spring extending between each of said supporting arms and said compressor means to resiliently support said compressor within said shell, each of said springs having a plurality of helical coils, said coils being of upwardly decreasing diameter so as to define a single upwardly converging tapered portion; and

stop means secured to said shell, said stop means being directly engageable with said shroud and cooperating with



said springs to limit relative movement of said compressor means with respect to said shell.

4,427,350

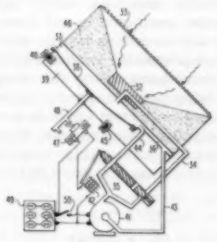
SOLAR DIAPHRAGM PUMP

Louis R. O'Hare, 1700 Banyan #3, Fort Collins, Colo. 80526

Filed Jan. 11, 1982, Ser. No. 338,283

Int. Cl.³ F04B *17/00, 43/06*

U.S. Cl. 417—379 **10 Claims**



1. A thermal powered diaphram pump comprising:

a fluid impelling means in the form of a chamber having inlet and exit check valves and having, as one of its walls, a diaphram capable of enlarging and of contracting the volume of the chamber by being extended into or expanded out of the chamber and,

an alternating fluid pressurization and depressurization means in the form of a second chamber having as one of its walls said diaphram, and said pressurization means being capable of expanding said diaphram into and extracting it from the fluid impelling means said second chamber being in fluid flow communication with a fluid thermal vaporization means and said second chamber being in fluid flow communication with a fluid cooling means and, a liquid fluid circulating means in the form of an exciter pump capable of being in fluid flow communication through ducting and valving first, in one time period, with the thermal vaporization means and with the interior of the second chamber and then in an alternate, second, time period being in fluid flow communication with the cooling means and the interior of the same second chamber, said fluid circulation means thereby being capable repeatedly of first impelling fluid in one closed cycle through ducting

and valving through said thermal vaporization means to the interior of said second chamber, and then later, in the second and alternate time period, being capable of impelling fluid in a closed cycle through ducting and valving to said fluid cooling means and on to the interior of the second chamber and,

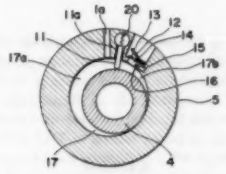
valve repeated switching means being capable of alternately providing fluid flow communication first to said vaporization means and then to said fluid cooling means.

4,427,351

ROTARY COMPRESSOR WITH NOISE REDUCING SPACE ADJACENT THE DISCHARGE PORT

Kiyoshi Sano, Shiga, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed Aug. 10, 1981, Ser. No. 291,932
Claims priority, application Japan, Sep. 3, 1980, 55-122627
Int. Cl.³ F04C *18/00, 29/06;* **F04B** *39/00*
U.S. Cl. 418—63 **4 Claims**



1. A closed type rotary compressor which comprises a closed housing, a motor and a compressor mechanism driven by said motor which are provided in said closed housing, said compressor mechanism having a cylindrical piston member eccentrically movably provided in a cylinder member, a partition plate member provided in said cylinder member for selective protrusion from and retraction into said cylinder member so as to divide the cylinder space defined between the inner wall of said cylinder member and the peripheral surface of said piston member into a compression side and a suction side, and bearing end plates secured to opposite ends of said cylinder member for closing the ends of said cylinder member and one of said end plates being provided with a discharge port for compressed refrigerant and a discharge valve for selective opening and closing of said discharge port, at least one of said cylinder member and said one bearing end plate having in the end face thereof a small volume space separate from said cylinder space and having a volume smaller than the maximum suction volume of said cylinder and a pressure introducing passage means, said pressure introducing passage means having one end communicating with said small volume space and the other end communicating with said compression space in the vicinity of said discharge port, said pressure introducing passage means having a cross-sectional area smaller than that of said small volume space.

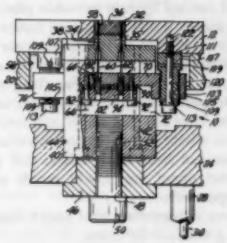
4,427,352

MOUNTING STRUCTURE FOR DIE, PUNCH AND CORE ROD ASSEMBLY FOR COMPACTING POWDER MATERIAL

Raymond P. DeSantis, Troy, and Herbert J. Puffer, Jr., Garden City, both of Mich., assignors to PTX-Pentronix, Inc., Lincoln Park, Mich.

Continuation-in-part of Ser. No. 351,482, Feb. 23, 1982, Pat. No. 4,390,335. This application Sep. 20, 1982, Ser. No. 419,815
Int. Cl.³ B30B *11/02, 15/02*
U.S. Cl. 425—78 **14 Claims**

1. In a punch and die assembly for a powder compacting press comprising a die plate, at least one punch reciprocable relative to said die plate and at least one core rod stationary relative to said die plate, said core rod having an end slidably disposed in a bore through said punch, a punch base member connected to a reciprocable platen supporting said punch, a core rod support member disposed in a recess within said punch base member and having integral support arms projecting through slots in said punch base member, means for attaching the end of said arms below said die plate and means mounting the other end of said core rod in said core rod support member and providing longitudinal adjustment of said core rod relative to said core rod support member, the improvement



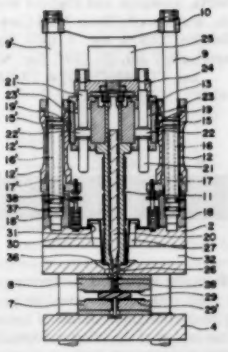
comprising a threaded member fastened at said other end of said core rod, said core rod support member having a core rod mounting plate, a core rod locking plate and a retainer plate applying said locking plate in engagement with said mounting plate, a threaded bore in said mounting plate accepting said threaded member, and a threaded bore in said locking plate aligned with said threaded bore in said mounting plate, wherein a slight thread mismatch is provided between said first and second threaded bores.

4,427,353

UPRIGHT INJECTION-COMPRESSION PRESSING MACHINE FOR THE MANUFACTURE OF INFORMATION CARRIER DISCS

Shoji Omiya, Shijonawate; Masaaki Sunohara; Tokihalu Nakagawa, both of Hirakata; Seiji Inagaki, Nara; Junnosuke Yamawaki, Sakurai; Nobuyuki Nakamura, and Kaoru Yanagisawa, both of Nagano, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd.; Teichiku Co., Ltd., both of Osaka and Nissei Plastic Industrial Co., Ltd., Nagano, all of, Japan

Filed Dec. 22, 1981, Ser. No. 333,621
Claims priority, application Japan, Dec. 26, 1980, 55-187765
Int. Cl.³ B29F *1/03*
U.S. Cl. 425—151 **7 Claims**



1. An upright injection-compression pressing machine for the manufacture of an information carrier disc, which comprises, in combination:

upper and lower fixed plates positioned one above the other and tie bars connecting said fixed plates to each other in face-to-face and spaced relation;

an upper mold carried by said upper fixed plate, said upper fixed plate having a nozzle receiving aperture extending therethrough and opening through said upper mold;

a movable plate in face-to-face relation to said upper mold, said movable plate being movably mounted on said tie bars for movement between said upper and lower fixed plates along said tie bars serving as guides therefor;

a lower mold carried by said movable plate;

a first drive means mounted on said lower fixed plate and operatively coupled to said movable plate for moving said movable plate to a first position wherein said movable plate is spaced from said upper fixed plate a distance sufficient to permit an information carrier disc to be removed from between said upper and lower molds, a second position where said upper and lower molds are spaced a small distance from each other, and a third position wherein said upper and lower molds are clamped together, respectively;

guide members mounted on said upper fixed plate and extending in a vertical direction;

a holder assembly slidably mounted on said guide members and pivotally mounted for pivoting movement laterally of said guide members;

a second drive means connected between said guide members and said holder assembly for reciprocatingly driving said holder assembly along said guide members;

an injection cylinder having the upper end inserted in and rigidly secured to said holder assembly and extending in a vertical direction therefrom and having a nozzle portion at the lower end for extending through said aperture in said upper fixed plate to supply a material to the space between said molds from the center of said upper mold, said injection cylinder having a feed screw therein;

a screw drive means operatively coupled to the upper end of said feed screw;

a third drive means on said holder assembly and operable to reciprocatingly drive said feed screw in said injection cylinder; and

first and second shielding sleeves secured respectively to a lower end of the injection cylinder and the upper fixed plate around said aperture, said first and second shielding sleeves being positioned one over the other so as to be substantially telescopically extendable for shielding said aperture in the upper fixed plate from the outside.

4,427,354

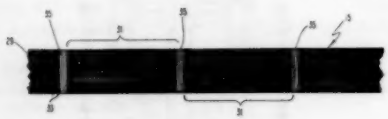
TINSEL FACETTING APPARATUS

Harold S. Roberts, Memphis, and Zigfried Weber, Germantown, both of Tenn., assignors to Decor Noel Corp., Memphis, Tenn.

Division of Ser. No. 27,810, Apr. 6, 1979, Pat. No. 4,385,087. This application Jul. 27, 1981, Ser. No. 287,065

Int. Cl.[3] **B29C** *17/14, 17/02*

U.S. Cl. 425—155 **17 Claims**



2. A tinsel facetting apparatus comprising:

two supply reels rotatably disposed to provide a flow line including two continuous feeds of metallized PVC film running one on top of the other to form a single PVC strip;

means located downstream from said supply reels for providing tension for pulling said PVC strip and causing said reels to rotate;

a tension control separately connected to each of said supply reels utilizing tension detectors and a braking force to control rotation of each said reel;

means for thermally facetting said PVC strip along a line perpendicular with said direction of flow;

means for intermittently slitting said PVC strip into spaced sections of strands running longitudinally of said strip, said strands constituting facetted icicles of predetermined length whereby both ends of said strands are connected to unslit portions of said strip;

means for cutting said PVC strip into segments having a length equal to said predetermined length plus the length of one of said unslit strip portions, so that the facetted icicles in each strip segment are attached at one end to an unslit header portion and are unattached and hang freely at the other end; and

a conveyor belt for receiving said strip segments and transporting them for further processing.

4,427,355

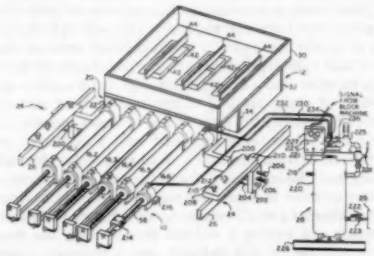
CORE PULLER ASSEMBLY

Oskar F. Vatterott, Pacific, Mo., assignor to MCIBS, Inc., Clayton, Mo.

Filed Nov. 27, 1981, Ser. No. 325,096

Int. Cl.[3] **B28B** *7/00*

U.S. Cl. 425—156 **18 Claims**



1. A core puller assembly for a block machine mold assembly comprising:

(a) a plurality of core puller units each including:

1. a cylinder having a forward end and a rearward end,
2. a piston mounted for sliding movement within the cylinder and having a rearwardly extending connecting rod,
3. a core puller bar disposed in side-by-side relation with the connecting rod, said bar including a radially offset from the axis of the forward portion cylinder movable alongside the cylinder and into the mold assembly and a rearward portion,
4. connecting means between the core puller bar and the connecting rod, and
5. guide means carried by the cylinder, said guide means receiving the core puller bar in sliding relation to guide said core puller bar into the mold assembly,

(b) support means interconnecting the core puller units together and aligning the core bars with the mold assembly, and

(c) drive means supplying fluid to the cylinders.

4,427,356

BONDABLE INSULATING PLATE

Gunter Kratel, Durach-Bechen; Hans Katzer, and Hans-Peter Kalmuk, both of Kempten, all of Fed. Rep. of Germany, assignors to Wacker Chemie GmbH, Kempten, Fed. Rep. of Germany

Filed Aug. 13, 1981, Ser. No. 292,684
Claims priority, application Fed. Rep. of Germany, Sep. 26, 1980, 3036422
Int. Cl.³ B32B 3/00
U.S. Cl. 428—195 6 Claims

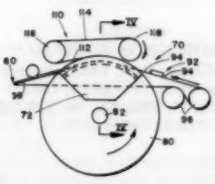
1. A bondable insulating plate comprising dispersed inorganic heat insulating material having a specific surface of from about 50 to 700 m^2/g and a binder, wherein the binder is inhomogenously distributed in the inorganic heat insulating material to provide a binder-rich layer, at one surface, containing from about 3 to 15% of binder based on the weight of the binder-rich layer and from about 0 to 1.5% by weight of binder in the inorganic heat insulating material in the plate outside of the binder-rich layer.

4,427,357

DOUGH BALL ROLLING APPARATUS

Joseph R. Anderson, Ada, Mich., assignor to Werner Lehara, Inc., Grand Rapids, Mich.

Filed May 7, 1982, Ser. No. 375,736
Int. Cl.³ A21B 7/01; A21C 11/00; B29C 15/00
U.S. Cl. 425—333 34 Claims



1. A device for shaping a piece of plastic or deformable material into a generally rounded form, said device comprising:

an elongated base having a pair of lateral edges;

an elongated support surface extending along one of said lateral edges of said base;

a movable rounding member defining an inner surface facing said elongated support surface, said rounding member, said base and said support surface defining a generally truncated V-shaped groove;

a lower conveyor belt having a run extending along said base within said groove;

an upper conveyor belt having a run extending in generally spaced, parallel relationship to said run of said lower conveyor belt; and

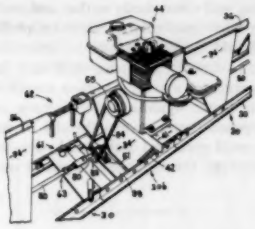
drive means operably connected to said rounding member, said lower belt and said upper belt for driving said member and said belts at different relative speeds to cause a piece of material transported into said groove by said lower belt to be shaped into a generally rounded form.

4,427,358

SECTIONAL CONCRETE SCREED MACHINE

Leo J. Stilwell, 31870 Peavine St., Dowagiac, Mich. 49047

Filed Jan. 15, 1982, Ser. No. 339,545
Int. Cl.³ B28B 1/08
U.S. Cl. 425—432 21 Claims



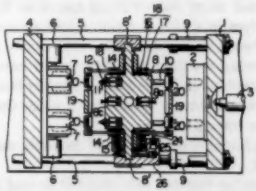
1. A knock-down vibrating concrete screed comprising elongate screed units attachable end-to-end in a longitudinally extending row to provide a screed of desired length, two of said screed units each comprising an elongate frame unit movable transversely over the concrete and vibration means for vibrating the corresponding frame unit for smoothing the concrete over which the frame unit moves, said two screed units having adjacent ends with coacting means for (1) positively blocking strictly coaxial longitudinal movement of said two screed units from detached into attached relation with each other, (2) blocking strictly coaxial longitudinal movement of said two screed units out of attached relation with each other, and (3) attaching the adjacent ends of said two screed units in response to longitudinal overlapping of said adjacent ends while transversely separated followed by movement of said adjacent ends one toward the other in one direction transverse to the length of the screed into an attached position of longitudinal alignment in which the thus longitudinally overlapped ends positively block further movement in said one direction.

4,427,359

INJECTION STRETCH-BLOW MOLDING MACHINE

Shigenori Fukuoka, Ichihara; Sadaharu Tsutsui, Yotsukaido, and Toshio Matsumaru, Chiba, all of Japan, assignors to Sumitomo Heavy Industries, Ltd., Tokyo, Japan

Filed Jul. 13, 1982, Ser. No. 397,700
Claims priority, application Japan, Jul. 14, 1981, 56-109749
Int. Cl.³ B29C 17/07
U.S. Cl. 425—525 3 Claims



1. An injection stretch-blow molding machine comprising: a stationary platen; a movable platen movable linearly with respect to said stationary platen; a carrier disposed between said stationary platen and said movable platen and movable linearly with respect to said stationary platen; at least one injection female mold part attached to the surface of said stationary platen facing said carrier; at least one blow female mold part attached to the surface of said movable platen facing said carrier; an injection male mold part mounted on said carrier so as to oppose said in injection female mold part; a blow male mold part provided with a stretching bar and

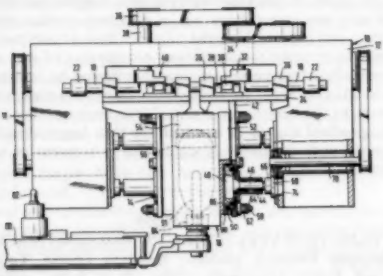
mounted on said carrier so as to oppose said blow female mold part; a rotary body mounted on said carrier for rotation about an axis perpendicular to the direction of movement of said carrier; at least one neck mold adapted to open and close and radially movably mounted on said rotary body, said neck mold being biased radially outwardly; a neck mold operating means for opening and closing said neck mold; means for intermittently rotating said rotary body so that said neck mold can take alternatingly and repeatedly an injection position where it is aligned with said female and male injection mold parts and a blow position where it is aligned with said female and male blow mold parts; and a mold clamping means adapted to press said movable platen against said stationary platen with said carrier interposed therebetween thereby to strongly connect said female mold parts and male mold parts for injection and blow, respectively, through the medium of said neck mold.

4,427,360

APPARATUS FOR BLOW MOLDING PLASTIC ARTICLES FROM A PARISON

Peter Albrecht; Wolfgang Reymann, and Klaus Vogel, all of Hamburg, Fed. Rep. of Germany, assignors to Krupp Corpoplast Maschinenbau GmbH, Hamburg, Fed. Rep. of Germany

Filed Dec. 30, 1981, Ser. No. 335,885
Int. Cl.³ B29C *17/07*
U.S. Cl. 425—541 **12 Claims**



1. Apparatus for blow molding plastic containers from blowable parisons comprising:

a stationary frame;

a pair of mold halves (**14, 16**) forming a mold cavity, at least one of said mold halves being movable for placing the mold halves in a closed position and an open position, a parison being insertable in the mold cavity and subjected to a blowing medium when the mold halves are in the closed position, and a finished container being removable and a new parison being insertable when the mold halves are in the open position;

a cylinder plate (**52**) on which said movable mold half (**16**) is mounted;

a mold carrying member (**42**) coupled to said cylinder plate so as to permit movement of said cylinder plate with respect to said mold carrying member, said mold carrying member being movably mounted on said frame for moving the mold half between the open and closed positions;

at least one piston (**46-48**) carried by said mold carrying member, said piston being in abutment with said frame and extending into a cylinder in said cylinder plate opposite said movable mold half; and

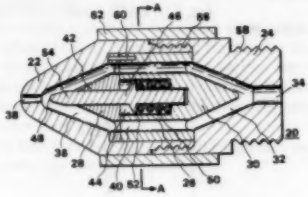
means for applying a pressurizing medium to said cylinder between said cylinder plate and piston to apply a force to the mold halves resisting separation of the mold halves.

4,427,361

SHUT-OFF NOZZLE FOR INJECTION MOULDING OF THERMOPLASTICS

Toshio Saito, Sawada Office, 1-9-5-1001 Kudan Kita, Chiyoda-ku, Tokyo 102, Japan

Filed Mar. 24, 1982, Ser. No. 361,588
Int. Cl.³ B29F *1/03, 1/08*
U.S. Cl. 425—549 **1 Claim**



1. A shut-off nozzle for injecting molten resin comprising:

a cylinder to be connected to a moulding machine;

a nozzle head attached to the front end of said cylinder to be connected a mould and having an ejection hole;

a flow path for molten resin through said cylinder and said nozzle head;

a torpedo disposed in said flow path, having a rim disposed between said cylinder and nozzle to hold said torpedo fixed; said rim being substantially coextensive with said torpedo to provide efficient heat conduction from said cylinder and nozzle to said torpedo, said torpedo further comprising a front portion having a hole aligned with said injection hole and a rear portion, said front and rear portions defining a cavity therebetween and a spring disposed within said cavity and;

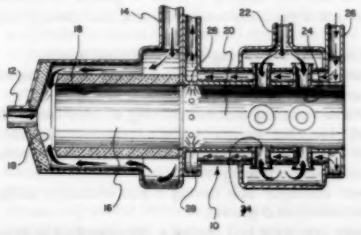
a shut-off pin protruding from the front end of said torpedo, through said hole and pushed forward by said spring by a shoulder disposed on said pin to block said ejection hole, said pin being adapted to withdraw from said ejection hole to allow the resin to flow through when a force applied on said pin by the resin pressure exceeds the spring force.

4,427,362

COMBUSTION METHOD

Owen W. Dykema, Canoga Park, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Aug. 14, 1980, Ser. No. 178,210
Int. Cl.³ F23J *7/00*
U.S. Cl. 431—4 **17 Claims**



1. In a method for substantially reducing emission of nitrogenous compounds formed during fuel combustion wherein a combustible fuel is at least partially combusted with oxygen, nitrogenous compounds being formed during the initial combustion of the fuel, the improvement comprising:

providing a nitrogenous compound decomposition zone;

introducing said fuel and an oxygen-containing gas into said

zone to form a combustible mixture, the gas being introduced in an amount to provide from about 45% to 75% of the total stoichiometric amount of oxygen required for complete combustion of the fuel;

reacting said combustible mixture to form combustion products including nitrogenous compounds;

providing finely dispersed particulates in said nitrogenous compound decomposition zone which enhance the conversion of the nitrogenous compound to molecular nitrogen, said particulates being selected from the group consisting of the sulfides and oxides of iron and calcium and combinations of these materials;

maintaining the resultant mixture of fuel, particulates, and combustion products at a temperature of at least 1800° K. for a time sufficient to reduce the nitrogenous compound content of said mixture to a desired level; and

discharging said mixture having a substantially reduced nitrogenous compound content.

4,427,363

FLAME RECTIFICATION DETECTORS

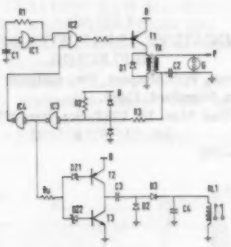
Paul S. Hammond, Sheldon, England, assignor to British Gas Corporation, London, England

Filed Mar. 3, 1981, Ser. No. 239,201

Claims priority, application United Kingdom, Nov. 6, 1980, 8035733

Int. Cl.³ F23N *5/00*

U.S. Cl. 431—66 **1 Claim**



1. A safety device for controlling the flow of fuel to a burner comprising:

an alternating current power supply;

a probe means disposed within the region occupied by a normally-burning burner flame and connected to said power supply;

ground electrode means positioned adjacent to said region to complete a conduction path through a normally-burning flame;

direct current detector means including a capacitor which is charged when a flame is present which detector means is connected to said probe means to detect a rectified alternating current indicative of the presence of a normally-burning flame;

inhibiting circuit means connected to said detector means and to said power supply periodically to interrupt the output from the power supply upon detection of direct current flow by said detector means wherein said inhibiting circuit means includes a gating means and a resistor means whereby the repetition rate of an inhibit signal is determined by the resistance of said resistor means and the capacitance of said capacitor as well as the trigger level of said gate means;

fuel flow control means connected to said detector means to control the flow of fuel to said burner whereby said fuel flow control means includes a diode pump circuit providing a null output in response to a steady-state input signal; and

flame control circuit means including a relay means which acts in response to the output of said pump circuit to thereby provide control of said flow of fuel to said burner.

4,427,364

FLUIDIZABLE BED COMBUSTION CHAMBER

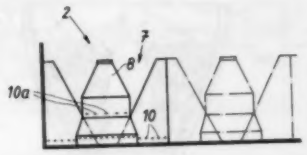
Jörgen Bergkvist, Finspong, Sweden, assignor to Stal-Laval Turbin AB, Sweden

Filed Oct. 9, 1981, Ser. No. 310,265

Claims priority, application Sweden, Oct. 22, 1980, 8007401

Int. Cl.³ F27B *15/10*

U.S. Cl. 431—170 **16 Claims**



1. In a fluidizable bed combustion chamber comprising an intermediate partition which divides said chamber into an upper combustion space and a lower plenum and which is provided with means for injecting air and fuel into said upper combustion space in which, in use of the combustion chamber, a bed of fluidized material is created, the improvement according to which said intermediate partition is composed of modules each having side edges defining a polygonal shape, a substantially centrally positioned fuel supply member and upwardly inclined corner surfaces defined by portions of said side edges which are upwardly inclined in the direction away from the center of the module, said corner surfaces comprising openings enabling air to be injected into said upper combustion space from said lower plenum.

4,427,365

LIQUID FUEL COMBUSTION APPARATUS

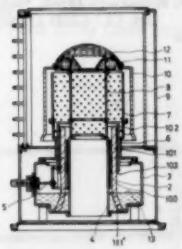
Takuro Kotera, Kawanishi; Yoshimi Ohmukai, Hirakata; Yoshitaka Kawasaki, Kadoma, and Kinichi Adachi, Takarazuka, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed Apr. 16, 1981, Ser. No. 254,745

Claims priority, application Japan, Apr. 17, 1980, 55-51186; Jun. 16, 1980, 55-81903

Int. Cl.³ F23D *5/00*

U.S. Cl. 431—196 **7 Claims**



1. A liquid fuel combustion apparatus which comprises: a wick assembly of a laminated structure having

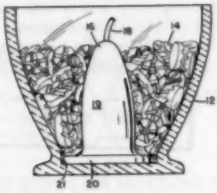
a main wick,

an auxiliary wick for fire-spreading, the bottom of which is disposed at a position below the surface of the oil and is to be lifted up from the oil surface during a steady-state combustion, and

at least one separator means partly sandwiched between said

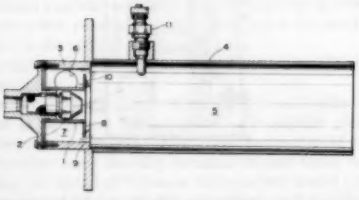
main wick and said auxiliary wick to separate said main wick from said auxiliary wick for preventing permeation of fuel therethrough.

4,427,366
SCENTED CANDLE
Kenneth L. Moore, 2135 Oak Creek, San Antonio, Tex. 78232
Filed Feb. 19, 1982, Ser. No. 350,162
Int. Cl.³ F23D *13/16*
U.S. Cl. 431—291 **3 Claims**



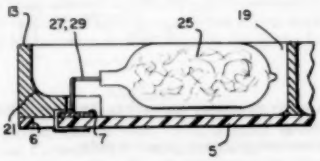
1. A scented candle, in combination, comprising:
a candle holder having vertically extending side walls of the type adapted to receive and encircle a candle and having a flat inner bottom;
a wick cone centrally disposed within said candle holder, wherein said wick cone comprises a generally tapering vertically extending first candle body member formed of slow-burning candle wax and having a candle wick extending substantially along the longitudinal axis thereof and a flat base member formed integrally with said first candle body member and extending therefrom to substantially cover the flat inner bottom of said candle holder and adapted to allow users to centrally and firmly position said wick cone within said candle holder; and
a plurality of molded oderizing chips of substantially uniform size formed of a faster-melting wax than said wick cone and at least one scent-producing material, said oderizing chips being disposed within said candle holder around said wick cone for controlled release of the scent-producing material in response to the heat of the flame of said wick cone when said wick cone is lighted.

4,427,367
SPRAY TYPE COMBUSTION DEVICE
Kenzi Yagisawa, Yokohama, Japan, assignor to Nissan Motor Co., Ltd., Yokohama, Japan
Filed May 7, 1981, Ser. No. 261,373
Claims priority, application Japan, May 9, 1980, 55-60683
Int. Cl.³ F23D *13/40*
U.S. Cl. 431—354 **11 Claims**



1. A combustion device comprising:
an outer cylinder;
an inner cylinder disposed within said outer cylinder to form an annular space between it and said outer cylinder, said annular space being supplied with air, said inner cylinder being formed with an air introduction opening through which the air within said annular space is introduced into a space defined inside said inner cylinder;
a baffle plate secured to an end of said inner cylinder and extending radially outwardly toward said outer cylinder, forming a clearance between the periphery thereof and said outer cylinder;
a restrictor plate secured to the end of said inner cylinder in a manner to close the opening of the inner cylinder end, said restrictor plate being formed with a central opening and a plurality of openings through which air within said inner cylinder flows out;
a combustion cylinder connected to said outer cylinder and forming thereinside a combustion chamber adjacent said baffle plate and restrictor plate, said combustion chamber communicating through said clearance with said annular space and through said openings with said space defined inside said inner cylinder; and
a fuel injection nozzle securely disposed inside said inner cylinder and so located that its tip section is close to said restrictor plate to define a restriction clearance between it and the periphery of said central opening to restrict air flow therethrough, said fuel injection nozzle being formed at its tip section with a nozzle opening through which fuel is injected to be supplied through said central opening into said combustion chamber.

4,427,368
SUBMINIATURE ARRAY WITH RETAINING REFLECTOR
Boyd G. Brower, Williamsport, Pa., assignor to GTE Products Corporation, Stamford, Conn.
Filed Mar. 18, 1982, Ser. No. 359,465
Int. Cl.³ F21K *5/02*
U.S. Cl. 431—359 **7 Claims**

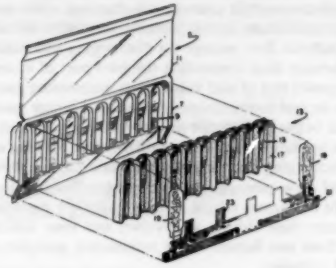


1. A miniaturized multilamp photoflash array having an envelope with a circuit board having a printed circuit of spaced electrical conductors on an inner surface thereof and a light transmittable cover member; a plurality of miniaturized photoflash lamps each having a pair of electrically conductive leads extending outwardly therefrom; and a reflector unit having cavities wherein said lamps are nested and said electrically conductive leads pass therethrough, said reflector unit affixed to said circuit board and having a retaining member forcing said electrically conductive leads against said printed circuit and a sonic projection sealed intermediate said spaced electrical conductors on said circuit board.

4,427,369
SWITCH PASTE WITH SILVER-COATED METAL BEADS
Boyd G. Brower, Williamsport, Pa., assignor to GTE Products Corporation, Stamford, Conn.
Filed May 20, 1982, Ser. No. 380,202
Int. Cl.³ F21K *5/02*
U.S. Cl. 431—359 **15 Claims**

11. A radiation-responsive switch for a multilamp photoflash

array comprising an admixture of silver carbonate and/or silver oxide, a binder material and characterized by the improvement wherein said admixture includes silver-coated metal particles in the amount of about 5 to 70% by weight.



4,427,370

METHOD OF TREATING RAW MATERIALS IN AN IRON REDUCTION PROCESS

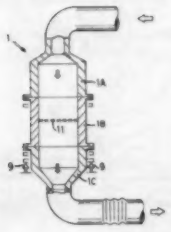
Yukio Koyabu, Niihama, Japan, assignor to Sumitomo Heavy Industries, Ltd., Tokyo, Japan

Filed Feb. 10, 1982, Ser. No. 347,671

Claims priority, application Japan, Feb. 19, 1981, 56-22424[U]; Feb. 20, 1981, 56-24044

Int. Cl.³ F27D *5/00, 15/00;* C21B *7/00*

U.S. Cl. 432—5 **7 Claims**



1. A method of treating raw material in an iron ore reduction process, in a grate furnace comprised of a first furnace section having a tiltable grate therein and a second furnace section which is vertically movable relative to said first furnace section, said first furnace section being movable sidewardly relative to said second furnace section between a first position located sidewardly of said second furnace section and a second position located in vertical alignment with said second furnace section, which method comprises the steps of feeding raw iron ore material onto the grate of said first furnace section while said first furnace section is in said first position, then moving said first section from said first position to said second position, then moving said second furnace section vertically into tight engagement with said first furnace section so as to hold said first and second furnace sections in a gastight relationship, heating said raw material to effect preliminary treatment thereof, and then tilting said grate to discharge said material from said grate furnace through an outlet provided on the side wall of the furnace.

4,427,371

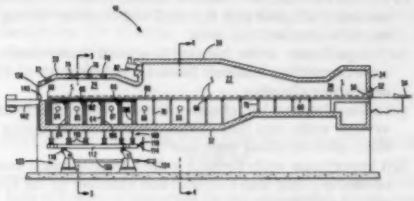
PUSHER FURNACE WITH SOAK ZONE LIFTER

Howard N. Unks, Glenshaw, Pa., assignor to Loftus Furnace Company, Pittsburgh, Pa.

Filed Jan. 20, 1982, Ser. No. 341,042

Int. Cl.³ F27D *3/00, 3/04;* F27B *9/14*

U.S. Cl. 432—11 **4 Claims**



3. In a method for heating slabs in a reheat furnace including stepwise pushing of said slabs along skid rails through a preheat zone and a heat zone, and stepwise pushing of said slabs through a soak zone, the improvement comprising:

providing a skid rail assembly and a lift rail assembly extending longitudinally along said soak zone; and

in cyclical fashion:

(a) pushing said slabs along said skid rail assembly;

(b) raising said slabs on said lift rail assembly a substantially uniform distance above said skid rail assembly to permit reduction of skid marks on the bottom portions of said slabs;

(c) lowering said slabs to reposition them on said skid rail assembly in substantially their original position prior to said raising step; and

(d) extracting a slab from the discharge end of said soak zone.

4,427,372

METHOD AND APPARATUS FOR CONTINUOUSLY BURNING PARTICLES IN AIR STREAM IN A VERTICAL FURNACE

Morimasa Takesue; Hiroyasu Otsuka, and Hiroyuki Yanagihara, all of Mitaka, Japan, assignors to Nittetsu Mining Co., Ltd., Tokyo, Japan

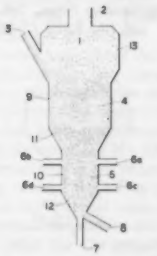
PCT No. PCT/JP81/00121, § 371 Date Jan. 6, 1982, § 102(e) Date Jan. 6, 1982, PCT Pub. No. WO81/03437, PCT Pub. Date Dec. 10, 1981

PCT Filed Jun. 1, 1981, Ser. No. 339,452

Claims priority, application Japan, Jun. 6, 1980, 55-75522; Jul. 29, 1980, 55-103166

Int. Cl.³ F27B *15/00;* C04B *7/02*

U.S. Cl. 432—14 **13 Claims**



1. A vertical furnace for continuously burning particles, said furnace comprising:

(a) a vertically elongated substantially tubular structure

defining, in a vertically successive downward arrangement:

(i) a precipitation chamber formed from imperforate vertical walls, said precipitation chamber having a first cross-sectional area;

(ii) imperforate walls forming a first frusto-conical zone connecting said precipitation chamber to the next lower chamber;

(iii) a rich fluidized bed chamber formed from imperforate vertical walls, said rich fluidized bed chamber having a second cross-sectional area;

(iv) imperforate walls forming a second frusto-conical zone connecting said rich fluidized bed chamber to the next lower chamber;

(v) a lean fluidized bed chamber formed from imperforate vertical walls, said lean fluidized bed chamber having a third cross-sectional area; and

(vi) imperforate walls forming a third frusto-conical zone connecting said lean fluidized bed chamber to the bottom of said tubular structure;

(b) a gas discharge opening at the top of said precipitation chamber;

(c) a particle inlet port in said precipitation chamber or said first frusto-conical zone;

(d) a vertically oriented inlet port for gas and/or a burnable fuel at the bottom of said third frusto-conical zone;

(e) at least one inlet port for gas and/or a burnable fuel in said lean fluidized bed chamber, said second frusto-conical zone, or said third frusto-conical zone; and

(f) a burned particle discharge port at the bottom of said third frusto-conical zone, wherein:

(g) said first cross-sectional area is larger than said second cross-sectional area, and said second cross-sectional area is larger than said third cross-sectional area and

(h) there are no inlet ports for gas and/or a burnable fuel in said rich fluidized bed chamber, said first frusto-conical zone, or said precipitation chamber,

whereby:

(i) said lean fluidized bed chamber is the zone of highest temperature and the temperature within the furnace decreases vertically from said lean fluidized bed chamber;

(j) the velocity of the gas in said lean fluidized bed chamber is higher than the velocity of the gas in said rich fluidized bed chamber, and the velocity of the gas in said rich fluidized bed chamber is higher than the velocity of the gas in said precipitation chamber; and

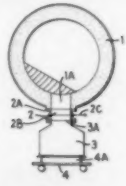
(k) the density of the particles in said lean fluidized bed chamber is lower than the density of the particles in said rich fluidized bed chamber.

4,427,373

METHOD OF DISCHARGING MATERIAL FROM A ROTARY FURNACE

Yukio Koyabu, Nihama, Japan, assignor to Sumitomo Heavy Industries, Ltd., Tokyo, Japan

Filed Feb. 10, 1982, Ser. No. 347,652
Claims priority, application Japan, Feb. 20, 1981, 56-24043
Int. Cl.³ F27B *15/00*
U.S. Cl. 432—14 **7 Claims**



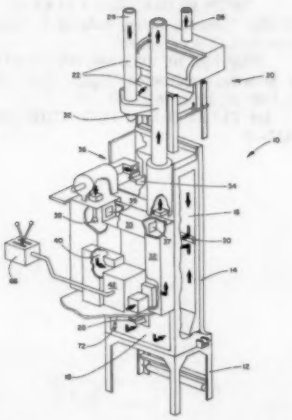
1. A method of treating and then discharging material from a rotary furnace having a discharge opening, comprising the steps of: feeding material from a preheater into the rotary furnace under gastight conditions; then subjecting said material to heat treatment within said rotary furnace while maintaining gastight conditions therein; connecting one end of an openable and shutable valve to the discharge opening of said rotary furnace while said valve is shut and while maintaining gastight conditions in said furnace, said valve defining a gastight material flow passage for discharging said material from said furnace; then connecting the inlet port of a container to the opposite end of said valve while maintaining gastight conditions in said furnace, thereby making a secure gastight connection between the inlet port of said container and the discharge opening of said rotary furnace; then opening said valve; and discharging said material from said furnace through said material flow passage into said container while maintaining gastight conditions in said furnace, said flow passage and said container; then closing said valve; and then detaching said valve from said furnace while maintaining gastight conditions in said container.

4,427,374

RECIRCULATION DEVICE

John W. Miller, Ossian, Ind., assignor to Phelps Dodge Industries, Inc., New York, N.Y.

Filed Aug. 19, 1981, Ser. No. 294,202
Int. Cl.³ F24H *1/00*; F27D *19/00*
U.S. Cl. 432—48 **5 Claims**

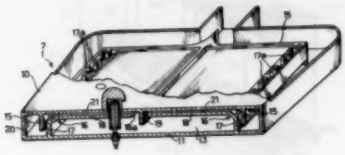


1. An oven recirculation device for recirculating a selected volume of preheated gas exhausted from a burner chamber together with fresh air through an oven and back to the burner chamber, the device comprising a first passageway having an entrance adapted to be connected to said burner chamber, a first exit adapted to be connected to said oven, and a second exit adapted to be connected to an oven exhaust, a second passageway having a first inlet and a second inlet and an outlet, said outlet adapted to be connected to said oven, a third passageway connecting said first exit and said first inlet, a fresh air inlet communicating with said second inlet, a back pressure damper adjacent said second exit, a control connected to said back pressure damper so that the volume of preheated gas flowing through said oven into said burner chamber may be selectively determined, and a mixing damper adjacent said second inlet, an automatic temperature-dependent control connected to said mixing damper so that the fresh air mixing with the preheated gas entering the burner chamber is dependent upon the temperature in the oven.

4,427,375
FLUIDIZED BED FURNACE

Gaetano Di Rosa, Pino Torinese, Italy, assignor to Fata European Group S.p.A., Turin, Italy

Filed Dec. 17, 1981, Ser. No. 332,101
Claims priority, application Italy, Dec. 24, 1980, 68991 A/80
Int. Cl.³ F27B 15/00; F23D 19/00; F23G 5/00
U.S. Cl. 432—58 11 Claims



7. A fluidized bed furnace comprising:

a support for a bed of refractory particles;

an air chamber located immediately below said support and including at least one air inlet means for introducing air into said air chamber;

a plurality of air supply conduit means in said support being in communication with said air chamber and including an air discharge means positioned above said support for supplying air to said bed;

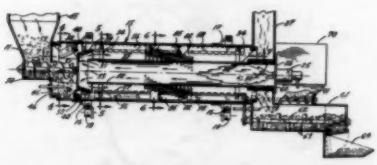
combustible gas supply means disposed within said air supply conduit means and including a gas discharge means positioned above said support for supplying combustible gas to said bed; and

partition means positioned within said air chamber for causing air to flow across substantially the entire undersurface of said support.

4,427,376
APPARATUS FOR HEATING AGGREGATE, RECYCLED ASPHALT AND THE LIKE

Robert E. Etnyre, Oregon, Ill., and William H. Wylie, El Reno, Okla., assignors to Wylie Manufacturing Company, Oregon, Ill.

Filed Jul. 16, 1982, Ser. No. 398,778
Int. Cl.³ F27B 7/36; B28C 1/22
U.S. Cl. 432—105 18 Claims

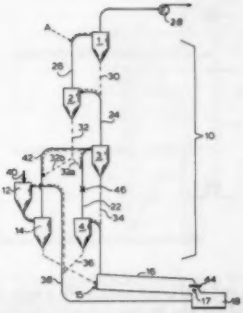


1. Apparatus for heating particulate material, said apparatus comprising an elongated drum having inlet and outlet ends, means for rotating said drum about its own axis, an elongated firing tube disposed centrally within said drum, said tube extending from the outlet end of the drum toward the inlet end of the drum and having a discharge end located adjacent the inlet end of the drum, the outer wall of said tube being spaced inwardly from the inner wall of said drum whereby an annular chamber is defined between said tube and said drum, a burner located adjacent the outlet end of said drum and positioned to direct a gaseous flame into the adjacent end portion of said tube, the hot gases from said flame flowing within said tube in a direction extending from the outlet end of the drum toward the inlet end of the drum and being directed out of the discharge end of said tube, means located adjacent the discharge end of said tube for directing the hot gases from said tube into said annular chamber and for causing said gases to flow within said chamber from the inlet end of said drum toward the outlet end thereof, means adjacent the inlet end of said drum for delivering particulate material into said chamber, means located between said drum and said tube for causing said material to tumble within said chamber as an incident to rotation of said drum, said material and said gases moving in the same direction through said chamber with said material being indirectly heated during such movement by the hot gases flowing in said tube and being directly heated by the hot gases flowing in said chamber, an upwardly extending exhaust stack adjacent the outlet end of said drum for receiving hot gases from said chamber and for effecting upward discharge of such gases, and a discharge opening adjacent the outlet end of said drum for discharging the heated material out of said chamber.

4,427,377
INSTALLATION FOR THE DRY MANUFACTURE OF CEMENT

Francis Dambrine, Louveciennes, and Gerard Ghestem, Santes, both of France, assignors to Fives-Cail Babcock, Paris, France

Filed Jul. 6, 1981, Ser. No. 280,540
Claims priority, application France, Jul. 9, 1980, 80 15236
Int. Cl.³ F27B 7/02
U.S. Cl. 432—106 7 Claims



1. An installation for the dry manufacture of cement, which comprises

(a) a clinkerization kiln having an inlet for precalcined cement raw material, an outlet for clinker produced in the kiln from the precalcined cement raw material and an outlet conduit for smoke gas generated in the kiln during the clinkerization,

(b) a cooling chamber for the clinker having an inlet connected to the clinker outlet of the kiln and an outlet conduit for hot air generated in the cooling chamber during cooling of the clinker,

(c) a preheater heat-exchange unit comprised of a plurality of cyclones series-connected in a circuit and including a last one of the cyclones, the preheater heat-exchange unit being connected to the smoke gas outlet conduit and receiving the smoke gas therefrom,

(d) means for circulating a current of the smoke gas through the preheater heat-exchange unit circuit in one direction,

(e) means for feeding the cement raw material into the circuit for counter-current flow therethrough,

(f) a precalcination kiln having an inlet connected to the hot air outlet conduit for receiving hot air and the preheated cement raw material, the hot air received in the precalcination kiln being utilized therein as combustion air, the preheated cement raw material being precalcined in suspension in the precalcination kiln and the precalcination kiln having an outlet for the precalcined cement raw material and smoke gas generated during precalcining,

(g) another cyclone having an inlet connected to the outlet of the precalcination kiln for receiving the pecalcined cement raw material and smoke gas therefrom and for

separating the precalcined cement raw material from the smoke gas, the other cyclone having an outlet conduit for the smoke gas connected to the circuit at a point downstream of the last cyclone of the preheater heat-exchange unit in the one direction, the smoke gases from the kilns being utilized in the circuit for preheating the cement raw material therein, and

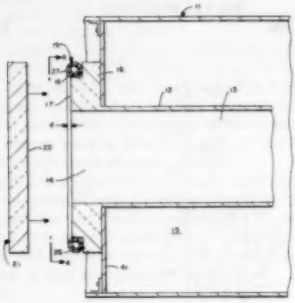
(h) a device for creating a gas pressure loss in the circuit between the last cyclone of the preheater heat-exchange unit and said point.

4,427,378

CLOSURE AND SEAL CONSTRUCTION FOR HIGH-PRESSURE OXIDATION FURNACE AND THE LIKE

Gerald M. Bowers, Boonville, Calif., assignor to Atomel Corporation, Sunnyvale, Calif.

Filed Mar. 29, 1982, Ser. No. 363,062
Int. Cl.³ F27D *1/18*; F26B *25/00*; F23M *7/00*
U.S. Cl. 432—242 **3 Claims**



1. A closure and seal construction for a high pressure oxidation furnace and the like having a quartz chamber and integral quartz wall formed with an opening for receiving into said chamber of material to be processed, said wall being formed with an annular recess surrounding said opening;

a tube mounted in said recess and comprising an interior metallic wall providing thermal conductivity and an elastomeric coating providing elasticity and dimensioned for protrusion of said coating from said recess and being adapted for connection to a source of coolant and for conduction of said coolant therethrough;

a closure and mounting means therefor juxtaposing said closure and wall and tube in covering relation to said opening and applying a closing pressure urging said closure toward said wall and tube, said closure having a flat annular surface confronting said wall and engageable with and compressing said coating; and

said coating being responsive to said clsoing pressure to seal said opening.

4,427,379

HEAT TREATMENT FIXTURE

Reginald F. Duran, 231 E. Borromeo, Placentia, Calif. 92670, and Jack Brass, 5650 Via Ceresa, Yorba Linda, Calif. 92686

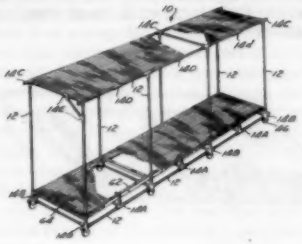
Filed Apr. 5, 1982, Ser. No. 365,188
Int. Cl.³ C21D *9/00*; B62B *1/00*; F27D *5/00*
U.S. Cl. 432—261 **11 Claims**

1. An improved heat treatment fixture for use in a heat treatment process, comprising:

a plurality of elongate members;

a plurality of couplings, each said coupling being cast as a single piece having a plurality of passages therein, each said passage being formed to receive an end of at least one of said plurality of elongate members to assemble said plurality of elongate members into a frame structure;

means carried by said frame structure for supporting parts desired to be heat treated thereon; and



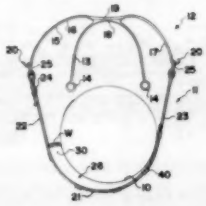
means for interconnecting said plurality of elongate members to said plurality of couplings to permit moderate movement of said plurality of elongate members relative to said plurality of couplings in response to thermal expansion encountered during the heat treatment process.

4,427,380

METHOD AND APPARATUS FOR THE GENERATION OF DIFFERENTIAL DISTAL MOVEMENT OF TEETH

Philip W. Carter, Box 357, St. Anne, Manitoba, Canada R0A 1R0, and Kenneth McLachlan, Box 150, St. Adolphe, Manitoba, Canada R0A 1S0

Filed Sep. 13, 1982, Ser. No. 416,845
Int. Cl.³ A61C *7/00*
U.S. Cl. 433—5 **40 Claims**



1. A neck band assembly for use in conjunction with an inner and outer bow appliance including strap anchoring or attachment means on the distal ends of the outer or facial bow; said neck band assembly comprising in combination

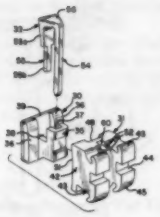
(a) a buttress component offset to one side of the appliance and;

(b) a neck strap operatively secured thereto and extending upon either side thereof, said neck strap including a resilient portion and means on the outer ends of said neck strap for connecting same to the outer ends of the associated outer bow of the appliance, whereby differential forces are applied to the associated appliance with the greater force being applied to the side of the appliance upon which the buttress component is offset.

4,427,381
COMBINATION LIGHT WIRE AND EDGEWISE APPLIANCE

Arthur B. Hall, LaPorte, Ind., assignor to TP Laboratories, Inc., Westville, Ind.

Filed Nov. 22, 1982, Ser. No. 443,458
Int. Cl.³ A61C 7/00
U.S. Cl. 433—14 **28 Claims**

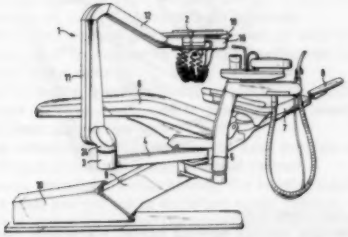


1. An orthodontic appliance for use in the light wire or the edgewise system comprising, a light wire bracket attachable to a tooth, said bracket having a mesiodistally extending and vertically opening archwire slot and an occlusogingivally extending lock pin channel, and an edgewise module mountable on said bracket, said module having a mesiodistally extending and labiobuccally opening rectangular archwire slot disposed at substantially the same vertical level as said archwire slot in said bracket.

4,427,382
DENTAL EQUIPMENT STAND

Jürgen Hoffmeister, Genova-Nervi, Italy, and Franz-Xaver Boeckh, Schönebürg, Fed. Rep. of Germany, assignors to Kaltenbach & Voigt GmbH & Co., Fed. Rep. of Germany

Filed Mar. 4, 1982, Ser. No. 354,892
Claims priority, application Fed. Rep. of Germany, Mar. 13, 1981, 3109721
Int. Cl.³ A61C 1/14
U.S. Cl. 433—79 **15 Claims**

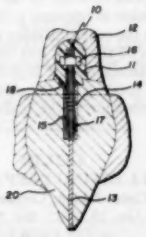


1. In a dental equipment stand, an adjustable multi-component carrying arm for supporting and positioning dental equipment, said arm and stand comprising:
(a) an L-shaped carrying means for supporting said arm, said carrying means providing a first vertical axis for rotation of said arm about a first circumferential path and a second axis for rotation of said arm along a portion of a second circumferential path,
(b) first and second pivot arms joined together by a single piece arcuate link member, said first pivot arm being pivotably mounted on said L-shaped carrying means to pivot about said second axis and to tranverse said first circumferential path, said second pivot arm being mounted on said single piece arcuate link member, said single link member also defining a first spring shackle,
(c) said first pivot arm defining a first pair of substantially parallel guide arms and said second pivot arm defining a second pair of substantially parallel guide arms, with said single arcuate link member effecting articulation from said first pair of guide arms to said second pair of guide arms,
(d) said L-shaped carrying means providing first and second spaced apart pivot points for supporting the first pair of guide arms, said L-shaped means also defining a second spring shackle mounted above the pivot points for said second pair of guide arms, with an adjustable spring means joining said first and second shackle to resiliently offset the weight of said guide arms and said headpiece,
(e) said second pair of guide arms terminating in a headpiece having first and second spaced apart pivot points for securing the second pair of guide arms,
(f) said headpiece supporting said dental equipment.

4,427,383
TOOTH RECONSTRUCTION

Melvin Goldman, 34 Brookshire Rd., Worcester, Mass. 01609

Filed May 6, 1982, Ser. No. 375,562
Int. Cl.³ A61C 5/08
U.S. Cl. 433—220 **2 Claims**

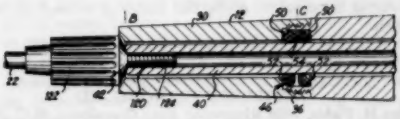


1. Method of restoring a tooth, comprising the steps of:
(a) cleaning out a root canal to form a cylindrical bore,
(b) inserting a threaded post in the bore and cementing it in place,
(c) threading a nut on the post, the nut being adjusted on the post so as to be located midway between the upper surface of the tooth and the upper end of the post,
(d) forming a plastic core in a generally smooth configuration on the post and nut,
(e) making an impression on the said core, and
(f) applying a crown made from the impression to the core.

4,427,384
VIBRATORY DENTAL SCALER

Anthony T. Sertich, 137 MacIntyre La., Allendale, N.J. 07401

Filed Jul. 22, 1982, Ser. No. 400,921
Int. Cl.³ A61C 1/07, 3/03
U.S. Cl. 433—120 **22 Claims**



1. A dental scaler of the type having a scaling tool to be vibrated at a high frequency, the dental scaler comprising:

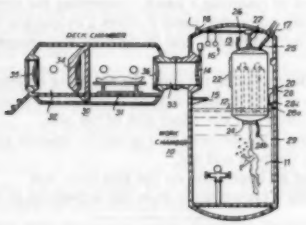
an outer tubular housing extending longitudinally between opposite ends;
a relatively rigid inner tubular member extending longitudinally within the housing between a first end and a second end;
coupling means for coupling the scaling tool to the first end of the inner tubular member;
support means for supporting the inner tubular member within the outer tubular housing;
an outer chamber located between the outer tubular housing and the inner tubular member;
an inner chamber located within the inner tubular member and having an inner periphery;
a relatively thin-walled tubular element having an outer periphery and located at a predetermined longitudinal position within the inner chamber;
at least one inlet port in the inner tubular member and extending from the outer chamber to the inner chamber at the predetermined longitudinal position; and
an outlet port communicating with the inner chamber;
the relative dimensions of the inner periphery of the inner chamber and the outer periphery of the tubular element providing a prescribed clearance between the tubular element and the inner tubular member for enabling relatively high speed rotation of the tubular element within the inner chamber in response to the passage of fluid under pressure from the outer chamber through the inner chamber, by means of the inlet and outlet ports, and the concommitant transmission of high-frequency vibratory energy from the rotating tubular element to the inner tubular member for vibration of the scaling tool.

4,427,385

MIXED GAS BELL DIVING DEEP OCEAN SIMULATOR

Andre Galerne, 4 Cedar Island, Larchmont, N.Y. 10538

Filed Jun. 23, 1982, Ser. No. 391,286
Int. Cl.³ G09B *9/00*
U.S. Cl. 434—29 **20 Claims**



1. Bell diving deep ocean simulator apparatus comprising a pressurizable wetpot work chamber; means for simulating a diving bell within said work chamber, said diving bell simulating means being provided with an entry port such that a person may enter the diving bell simulator means, said diving bell simulator means being operable for said person to execute a simulated dive; and means for adjusting the pressure within the work chamber and diving bell simulator means to simulate lowering or raising the diving bell simulator means to an ocean depth.

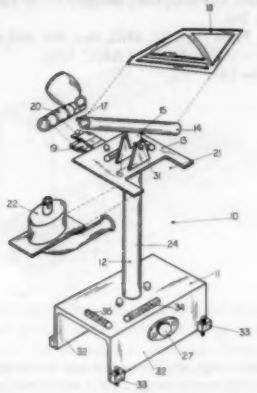
4,427,386

ARTILLERY TRAINING AID

Max H. Fields, 1609 Ridgewood Ave., Greensboro, N.C. 27405

Filed Jan. 4, 1982, Ser. No. 336,938
Int. Cl.³ F41G *3/26*
U.S. Cl. 434—19 **7 Claims**

1. A training aid comprising: a base, having a leg member, a leveling means, said leveling means attached to said leg member, a rotatable staunchion, said staunchion including a gear means, said staunchion joined to said base member at its lower end, a platform member, said platform member joined to the upper end of said staunchion, a tube member, and a trunnion



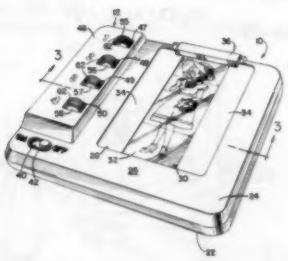
member, said trunnion member adjustably connecting said tube member to said platform member.

4,427,387

DRAWING TOY

Tohru Tomita, Tokyo, Japan, assignor to Takara Co., Ltd., Tokyo, Japan

Filed Aug. 31, 1982, Ser. No. 413,468
Claims priority, application Japan, Sep. 17, 1981, 56-137872[U]
Int. Cl.³ G09F *11/18*; G09B *11/06*
U.S. Cl. 434—88 **1 Claim**



1. A toy comprising:
a generally boxlike housing having a generally flat upper surface portion including a window and adjacent this upper surface portion a raised section including wheel means rotatably mounted within the raised section, said wheel means having at least a portion extending from the raised section which may be manually manipulated to rotate the wheel means, said wheel means having serrated surfaces made of an elastomeric material;
a plurality of endless belts, each having light transmitting and light blocking segments which form on the surface of each belt a series of figure fragments, each of said belts being adapted to move along separate paths to advance sequentially the different figure fragments displayed on the surface of the belts to the window, said belts being mounted within the housing on spaced roller means disposed beneath and on opposite sides of the window and adapted to rotate freely to move the belt carried by the roller means along separate parallel paths so that each belt

moves along a lower flight and an upper flight, each of said belts engaging one of said wheel means so that the serrated surface of the wheel means is in frictional contact with the surface of the belt;

a light source in the housing beneath the window and between the upper and lower flights of the belts;

a generally flat, transparent platen beneath the upper flight of the belt and above the light source for supporting the upper flight of the belt and a sheet of semi-transparent writing material resting on the flat upper surface portion of the housing and over the window;

a transparent protective member at the window, with the upper flight of the belt at the window being sandwiched between said protective member and the platen; and

means adjacent the window for releasably holding the writing material at the window.

4,427,388

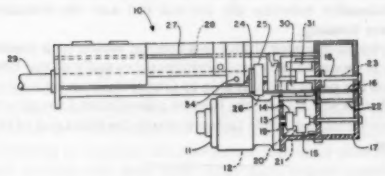
YOKE MOVER

Dana R. Hope, Enon, Ohio, assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Aug. 11, 1982, Ser. No. 407,220

Int. Cl.³ G09B 9/08

U.S. Cl. 434—45 **2 Claims**



1. A servomechanical controller for inputting electronically prerecorded commands to a flight simulator having a wheel and column type control, comprising:

a. an output shaft operatively interconnected to said wheel to provide pitch control to said wheel in response to axial movement of said shaft, and roll control to said wheel in response to rotative movement of said shaft;

b. first means, operatively interconnected to said shaft, to impart axial movement to said shaft in response to electronic inputs thereto;

c. second means, operatively interconnected to said shaft to impart rotative movement to said shaft in response to electronic inputs thereto;

d. first transducer means sensing the axial position of said shaft and providing an output signal thereof;

e. second transducer means sensing the angular position of said shaft and providing an output signal thereof;

f. a force sensor for sensing the torque and axial load on said shaft and providing output signals thereof; and

g. electrical means operatively interconnecting said first means, second means, first and second transducer means, and force sensor for providing said electronic inputs to said first and second means in response to said electronically prerecorded commands and said output signals.

4,427,389

TOY COIN CHANGER

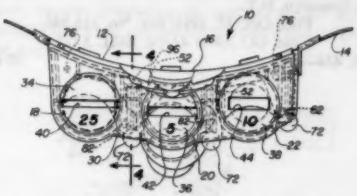
Bruce M. D'Andrade, Whitehouse Station, N.J., assignor to Arco Industries Ltd., Hong Kong, Hong Kong

Filed Apr. 19, 1982, Ser. No. 369,890

Int. Cl.³ G09B 19/00; A63H 33/30; G07D 1/00

U.S. Cl. 434—110 **9 Claims**

1. A toy of an educational nature comprising in combination, a plurality of tubular receptacles supported in a frame adjacent each other, a plurality of toy coins respectively of different diameter and thickness corresponding to indicating means on the coins designating the values thereof, said frame having entrance openings respectively aligned with similar ends of said receptacles and having lengths and widths respectively corresponding to the different diameters and thicknesses of



said coins, whereby only the coins of the diameter and thickness corresponding to the lengths and widths of the several entrance openings will pass therethrough into the receptacles, and removal means associated with each receptacle and operable to effect removal of the coins from said receptacles.

4,427,390

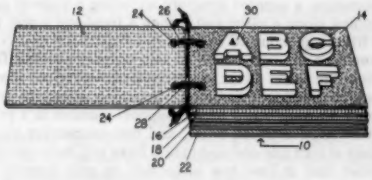
EDUCATIONAL BOOK-LIKE TOY

Manger, Nina, 7855 Boulevard East Apt. 10-D, North Bergen, N.J. 07047

Filed Oct. 26, 1981, Ser. No. 315,190

Int. Cl.³ G09B 1/06

U.S. Cl. 434—159 **3 Claims**



1. An instructional toy comprising:

(a) differently colored rigid pages with items of printed matter printed thereon;

(b) individual objects which are relatively thick in comparison to said rigid pages, substantially as thick as a child's finger; and colored a distinguishable shade of the color of the rigid page to which they correspond;

(c) fastening elements disposed on said rigid pages; and

(d) mating fastening elements disposed on the undersides of said individual objects, wherein the shape of the underside of each of said individual objects corresponds identically to the shape of only one of said items of printed matter; each of said individual objects has one of said mating fastening elements disposed on its underside and covering only a portion of said underside; each of said items of printed matter has one of said fastening elements disposed on the area defined by said printed matter and covering only a portion of said area; and each of said fastening elements is positioned to confront its corresponding mating fastening element only when each of said items of printed matter confronts the underside of its matching individual object,

wherein said rigid pages are each uniquely colored, the order of said colored pages being yellow, orange, red, violet, blue and green to teach color theory surreptitiously while another learning process is taking place, the later learning process occurs when the individual "feels" the

objects while placing them in their proper places on the differently colored rigid pages.

4,427,391

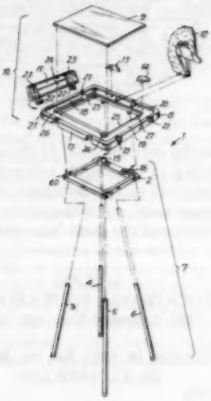
CONVERTIBLE DRAWING ARTICLE OF FURNITURE

Morton Berman, Brooklyn, N.Y., assignor to Avalon Industries, Inc., Brooklyn, N.Y.

Filed Oct. 27, 1981, Ser. No. 315,540

Int. Cl.³ A47B *41/04*; B43L *5/02*

U.S. Cl. 434—408 **30 Claims**



1. A convertible drawing article of furniture comprising, in combination, a support structure including a support member extending along a plane and having a front and a rear region, two front legs mounted on the front region and two rear legs mounted on the rear region of said support member for supporting the latter at a predetermined elevation above the ground; a drawing board; first connecting means for connecting said drawing board to said support member in a prostrate position relative to the latter, said first connecting means including at least one opening in said front region of said support member, and at least one projection on said drawing board received in said opening in said prostrate position; and second connecting means for connecting said drawing board to said support member in an upright position relative to the latter.

4,427,392

PEDAL DRIVEN OUTBOARD PROPELLER AND STEERING ASSEMBLY

Harold J. Schneider, 7801 SE. Pacific #13, Lacey, Wash. 98503

Filed May 18, 1981, Ser. No. 264,672

Int. Cl.³ B63H *16/00*

U.S. Cl. 440—30 **3 Claims**

1. A foot pedal driven propeller drive and hand operated steering assembly for a boat, comprising:

a mounting frame that is detachably connectable to a blunt end of a boat;

said frame including an upper housing which in use is positioned endwise outwardly of the blunt end of the boat, and an inner end which is positioned in the boat inwardly of the blunt end of the boat;

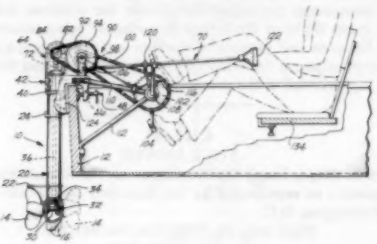
a rotatable lower housing, mounted for rotation about a vertical axis, and depending from the upper housing, and carrying a propeller at its lower end;

vertical drive shaft means extending through the rotatable lower housing and at its upper end projecting into the upper housing, and at its lower end being drivingly connected to a propeller;

foot pedal operated drive crank means supported at the inner end of said frame;

drive transmission means interconnected between the foot pedal driven drive means and the upper end of said vertically oriented drive shaft; and

hand operatable steering means connected to the rotatable lower housing and including a first bevel gear within said upper housing, a second bevel gear meshing with the first bevel gear, and rotatable control rod means extending laterally outwardly of said upper housing from the second bevel gear to a position which is inwardly of the boat from the blunt end of the boat, and a control handle secured to the inner end of the rotatable control rod;



said bevel gears providing a substantially one to one drive relationship between the control rod and the rotatable lower housing;

whereby an operator sitting in a boat on which such assembly is mounted, in a seat positioned inwardly of the boat from the pedal drive, is able to propel the boat by his feet and steer and reverse the boat by a simple hand rotation of the control rod, while facing towards the blunt end of the boat.

4,427,393

PROPULSION OF SHIPS

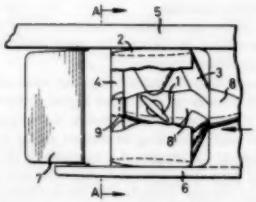
Eric R. May, Sevenoaks, England, assignor to Vickers Public Limited Company, London, England

Filed Oct. 21, 1981, Ser. No. 313,692

Claims priority, application United Kingdom, Oct. 24, 1980, 8034420

Int. Cl.³ B63H *5/16*

U.S. Cl. 440—67 **3 Claims**



1. A propulsion unit for a marine vessel intended to operate under severe ice conditions, comprising a multibladed propeller, a stationary duct that embraces said propeller peripherally around the full 360° and within which said propeller runs and is protected against ice damage, massive water-inlet guide vanes and stator blades at the forward and aft ends of said duct respectively, said guide vanes and stator blades being inclined at angles to respective planes extending through the axis of rotation of said propeller and being inclined toward opposite sides of said planes fore and aft of said propeller thereby to increase the propulsive efficiency, and said guide vanes and stator blades having strength and dimensions adequate to divert large masses of ice away from said propeller and to restrict

the size of ice masses that can encounter said propeller by entering said duct at said ends thereof, a ring member at the aft end of said duct coaxial with said propeller to which inner ends of said stator blades are secured, and a further structure coaxial with said propeller at the forward end of said duct to which the inner ends of said guide vanes are secured, said stator blades and guide vanes extending from their said inner ends to said duct.

4,427,394

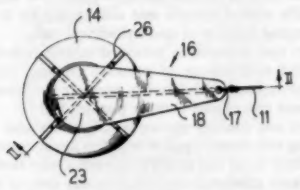
APPARATUS TO BE TOWED THROUGH THE WATER

Mark R. Felter, 2626 Indian Hill Rd., Cedar Rapids, Iowa 52403

Filed Oct. 7, 1981, Ser. No. 309,211

Int. Cl.³ B63C 9/16

U.S. Cl. 441—66 **1 Claim**



1. A water sport device adapted to be mounted on an inner tube comprising, a seat portion of plastic material, attaching means connecting said seat portion to said inner tube and extending over the center opening thereof, a pair of extending portions of plastic material attached to said seat portion and extending in opposite directions over said inner tube from said seat portion and with their outer ends joined together at a substantial distance from said inner tube and on the outside of the inner tube, and tow grommets mounted therein, a tow line connectable to the outer ends of said pair of extending portions at said tow grommets, wherein said attaching means comprises four straps attached to said seat portion and pass around said inner tube to attach said seat portion to said inner tube and are X-shaped, wherein said attaching means includes four buckles respectively mounted on said four straps for attaching said straps to said inner tube, wherein a first two of said four straps are joined end to end, wherein a second two of said straps are joined end to end and including a third pair of straps which reinforce said extending portions and extend from said tow grommets in said outer ends and pass all the way through the seat and through the X formed by said other four straps and all the way through the seat and back to said tow grommets.

4,427,395

METHOD FOR MAKING A DIPOLAR-DEFLECTING AND QUADRUPOLAR-FOCUSING COLOR-SELECTION STRUCTURE FOR A CRT

Steven A. Lipp, Hopewell, and Michael P. Adams, Mercerville, both of N.J., assignors to RCA Corporation, New York, N.Y.

Filed Aug. 24, 1982, Ser. No. 410,962

Int. Cl.³ H01J 9/233

U.S. Cl. 445—37 **10 Claims**

1. In a method for making a dipolar-deflecting and quadrupolar-focusing color-selection structure for a cathode-ray tube comprising

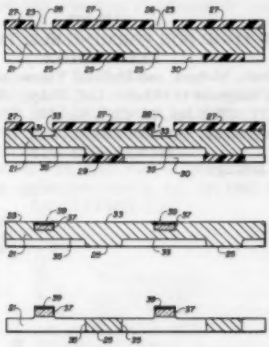
A. providing a metal plate having two opposed major surfaces,

B. producing an array of substantially-parallel grooves in one of said surfaces, said grooves being spaced by substantially-parallel ridges of plate metal,

C. producing in the other of said surfaces an array of shaped depressions opposite said grooves and extending only partially through said plate, and less than the distances required to connect to said grooves, said depressions being substantially wider than the widths of said grooves,

D. filling said grooves with an etch-resistant, electrically-insulating material,

E. removing said ridges of metal from said one of said surfaces down to depths to connect with said shaped depressions, thereby producing an array of shaped apertures through said plate and electrically-insulating strips across the apertures,



F. and covering selected surface portions of said electrically-insulating material with a coating of electrically-conducting material, said coating of electrically-conducting material being spaced from said plate,

wherein, after step C and before step D, the surfaces of said grooves are coated with a resistive or semiconductive material.

4,427,396

METHOD OF MANUFACTURING A DEEP DRAWN CRT

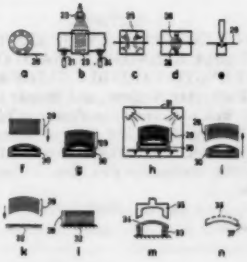
Adrianus H. M. van den Berg, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Jan. 18, 1982, Ser. No. 339,930

Claims priority, application Netherlands, Feb. 16, 1981, 8100730

Int. Cl.³ H01J 9/233

U.S. Cl. 445—47 **4 Claims**



1. A method of manufacturing a colour selection electrode for a colour display tube, which colour selection electrode comprises a shadow mask blank which having a pattern of apertures, the method comprising the steps of:

(a) providing patterns of apertures in a steel foil by means of a photoetching process,

(b) cutting mask blanks from the steel foil, each mask blank having a pattern of apertures,

(c) annealing a stack of mask blanks at a maximum temperature which is above the temperature at which the mask blanks begin to adhere together, and

(d) deep drawing each mask blank in a dish form, characterized in that

(e) prior to annealing, the mask blanks are stacked on a curved substrate, and

(f) after annealing, the stack of mask blanks is placed on a flat substratum.

4,427,397

METHOD FOR FORMING ELECTRON GUN ELECTRODES

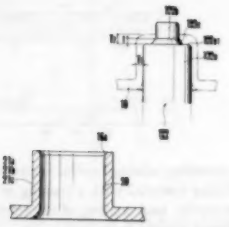
Satoru Endo, Mobara, and Masaaki Yamauchi, Togane, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jun. 22, 1981, Ser. No. 276,039

Claims priority, application Japan, Aug. 1, 1980, 55-105000

Int. Cl.³ H01J 9/14

U.S. Cl. 445—49 **4 Claims**



1. A method of forming an electron gun electrode of color picture tube comprising the steps of:

forming three spaced openings through a metal plate;

squeezing said metal plate to form three inverted cup shaped cylindrical projections having said opening at their top centers;

coining inner peripheries of said openings to enlarge the same and to form bevelled portions around the peripheries of the enlarged openings wherein said bevelled portion has a thickness of more than one third of the thickness of the metal plate; and

increasing inner diameters of said cylindrical projections thereby obtaining the electrode integrally formed with three adjacent cylindrical projections.

4,427,398

DEVICE FOR COUPLING AND UNCOUPLING TWO PARTS MOVABLE RELATIVE TO EACH OTHER USING A LENGTH-VARIABLE GUIDE ROD

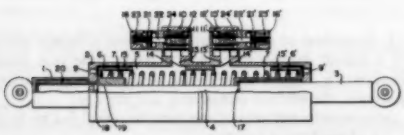
Hans-Dieter Eisbrecher, Vellmar, and Helmut Ruppert, Kassel, both of Fed. Rep. of Germany, assignors to Thyssen Industrie Aktiengesellschaft, Essen, Fed. Rep. of Germany

Filed Oct. 23, 1981, Ser. No. 314,104

Claims priority, application Fed. Rep. of Germany, Oct. 29, 1980, 3040650

Int. Cl.³ F16D 3/06

U.S. Cl. 464—26 **9 Claims**



1. A device for coupling and uncoupling two parts which are movable relative to one another by means of a length-variable guide rod, said device comprising:

a tubular guide rod segment;

a housing arranged on said tubular guide rod segment and having a cylinder chamber;

an axially shiftable guide rod segment provided with a cylindrical part which extends in said cylinder chamber;

two sets of at least one annular piston each, said sets of annular pistons being arranged in said cylinder chamber and around said cylindrical part of said axially shiftable guide rod segment;

engaging portions being arranged on said cylindrical part for engaging said annular pistons;

at least one preloaded coil spring arranged between said annular pistons, which serve as supports therefor and are therefor spring-loaded, with one of said spring-loaded annular pistons, upon exertion of a pulling or compressive force on said axially shiftable guide rod segment, being axially shifted against said coil spring by the associated engaging portion of said cylindrical part;

at least one connection provided in said housing and connected to a source of pressure medium for selectively supplying and withdrawing, pressure medium to and from at least one of said annular pistons; and

at least one locking device arranged on said housing for fixing said annular piston which is acted upon by pressure medium in an end position in such a way that said axially shiftable guide rod segment is axially free, or is shiftable at a lesser force, by a given distance relative to said now fixed annular piston, said fixed annular piston being releasable by said locking device and, after discharge of pressure medium, being returnable to its spring-loaded starting position by the pressure of said coil spring.

4,427,399

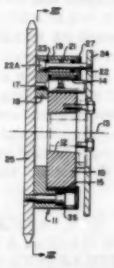
OVERLOAD COUPLING OR CLUTCH

Rome R. Rudolph, deceased, late of Gibsonia, Pa., and by Kathleen Rudolph, executrix, 4113 Lee Rd., Gibsonia, Pa. 15044

Filed Sep. 3, 1981, Ser. No. 298,931

Int. Cl.³ F16D 7/00, 43/20

U.S. Cl. 464—38 **9 Claims**



1. An overload coupling or clutch comprising a housing having a plurality of plunger sockets generally parallel with and radially dispersed about a rotational axis about which said housing can rotate, a plurality of plungers each slideable lengthwise in one of said plunger sockets such that a conical end face on each plunger projects from one side of said housing while a shank portion of the plunger projects from the opposite side of the housing, hub means having a plurality of plunger seats each aligned to engage with the conical end face of one of said plungers, said hub means being rotatable about said rotational axis, a pressure plate for engaging with shank portions of said plungers projecting from said housing, said hub means further having a plurality of pull pin sockets distinct and apart from said plunger sockets, and a plurality of spring-biased pull pins each having a spring supported in one of said pull pin sockets by said hub means, said pull pins being engaged with

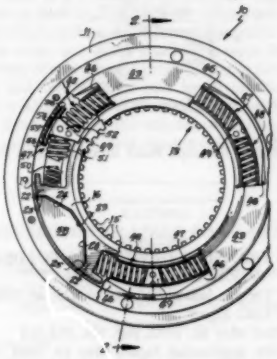
said pressure plate for directing a torque-limiting force against said plungers to maintain the conical end faces thereof engaged in the seats of said hub means.

4,427,400

SERIES DAMPER DYNAMIC LAG SYSTEM

Paul E. Lamarche, Utica, Mich., assignor to Borg-Warner Corporation, Chicago, Ill.

Filed Dec. 18, 1981, Ser. No. 332,031
Int. Cl.³ F16D 3/14
U.S. Cl. 464—64 **10 Claims**



1. A torsional vibration damper assembly for use in a vehicle clutch to transmit torque between driving and driven members including an input member operatively connected to torque input means, a hub member operatively connected to torque output means and having at least two circumferentially equally spaced radial arms, at least one spring separator positioned between adjacent hub arms and floating independently of the hub member, compression spring sets interposed between said hub arms and spring separators, and a pair of retainer plates operatively connected to said input member and substantially enclosing the hub member, spring separators and spring sets, said retainer plates having axially aligned elongated arcuate slots separated by inwardly offset drive straps and accommodating said spring sets, the improvement comprising a notch formed in the outer edge of each hub arm, and a friction lag plate received in each notch, said notches in the hub arms and the friction lag plates having complementary camming surfaces acting to urge the lag plates outwardly into sliding engagement with said retainer plates upon rotation of said hub member.

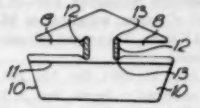
4,427,401

COMPOSITE DRIVING BELT WITH TRANSVERSE AND INTERMEDIATE ELEMENTS

Emerie F. M. Hendriks, Heeze, and Theodorus P. M. Cadee, Goirle, both of Netherlands, assignors to Van Doorne's Transmissie B.V., Tilburg, Netherlands

Filed Sep. 26, 1980, Ser. No. 191,817
Claims priority, application Netherlands, Sep. 27, 1979, 7907181
Int. Cl.³ F16G 5/16
U.S. Cl. 474—201 **5 Claims**

1. A V-belt comprising an endless flexible carrier having side edges, a plurality of substantially non-deformable transverse elements arranged slidably on the endless carrier, said transverse elements having side edges facing the side edges of the carrier; and a plurality of intermediate elements distinct from the carrier and from the transverse elements and disposed between said side edges of the endless carrier and said side edges of the transverse elements so that said side edges of the carrier do not contact the transverse elements, said intermediate elements extending longitudinally along more than one



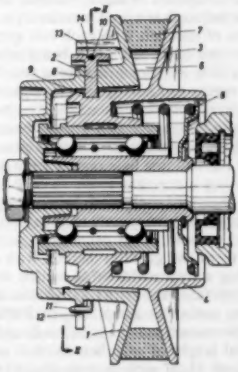
transverse element and consisting of substantially rectangular plates, a face of which is convexly curved.

4,427,402

INFINITELY VARIABLE CONE DISK-WRAPPING VEE BELT DRIVE FOR DRIVING A MOTORCYCLE

Konrad Steinhofer, Graz, Austria, assignor to Steyr-Daimler-Puch Aktiengesellschaft, Vienna, Austria

Filed Mar. 23, 1981, Ser. No. 246,582
Claims priority, application Austria, Apr. 10, 1980, 1935/80
Int. Cl.³ F16H 55/52
U.S. Cl. 474—13 **4 Claims**



1. An infinitely variable cone disk-wrapping V-belt drive for a motorcycle, comprising

(a) a pair of coaxial cone disks defining between them a V-shaped groove and comprising an axially fixed, first cone disk including a first hub, a second cone disk axially displaceable relative to said first cone disk and including a second hub surrounded by said first hub, the second hub defining a peripheral recess,

(b) a V-belt trained around said first and second cone disks in said V-shaped groove,

(c) first spring means urging said second cone disk axially towards said first cone disk,

(d) locking means including a locking member non-rotatably connected to, and extending radially through, said first hub, the locking member being radially slidably mounted in said first hub and constituting a flyweight adapted to extend into the peripheral recess to hold said second hub locked against axial displacement, and the first hub being integrally formed with an eyelet diametrically opposite to said locking member,

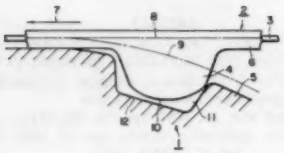
(e) second spring means including an annular spring spaced around said first hub and having end portions hooked into said eyelet, the annular spring urging said locking member into the locking position, and

(f) the locking means being arranged to unlock said second cone disk in response to a centrifugal force acting on said locking means and overcoming the force of said annular spring.

4,427,403
TOOTHED BELT POWER TRANSMISSION DEVICE

Katsuo Kanamori, Kobe; Hiroyuki Okawa, Amagasaki; Takahide Mizuno; Fumihito Nakagawa, both of Kobe, and Isamu Nagai, Kyoto, all of Japan, assignors to Mitsubishi Jidosha Kogyo Kabushiki Kaisha, Tokyo and Mitsuboshi Belting Ltd., Kobe, both of, Japan

Filed Aug. 31, 1981, Ser. No. 298,142
Claims priority, application Japan, Sep. 3, 1980, 55-122685
Int. Cl.³ F16H *7/02*; F16G *1/28*
U.S. Cl. 474—153 **12 Claims**



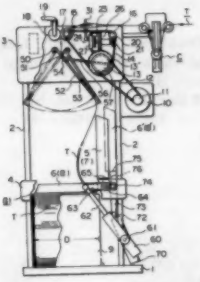
1. A toothed belt power transmission device comprising a toothed belt comprised of elastic material and having alternating grooves and teeth at a predetermined pitch in the longitudinal direction of said belt with each belt groove having a bottom surface and each belt tooth being symmetrical about a tooth center line and comprised of a first base region and a second top region and having a total height H_b measured from said belt groove bottom surface, said first base region of each tooth extending from said belt groove bottom surface with a height h_t which is between substantially 60 to 95 percent of said total height H_b, said first base region being defined by flat slant surfaces having a constant tooth angle θ therebetween, said second top region of each tooth being comprised of at least a subregion defined by an arcuate surface having a center curvature located on said tooth center line and a pulley having alternating teeth and grooves thereon with each tooth of said pulley having a trapezoidal cross-section defined by substantially linear surfaces and with each groove of said pulley having a bottom surface at a depth H_p such that the dimensional relation between said pulley groove and said belt tooth is such that the total height of each belt tooth is equal to or greater than said depth H_p of each groove of said pulley so that upon mating engagement between said belt and said pulley, only said subregion of said belt tooth is pressingly deformed against the bottom surface of said pulley groove.

4,427,404
APPARATUS FOR STACKING A TAPE OF INDEFINITE LENGTH IN FOLDED CONDITION

Yasuo Yamada, Kurobe, Japan, assignor to Yoshida Kogyo K. K., Tokyo, Japan

Filed Dec. 15, 1981, Ser. No. 330,945
Claims priority, application Japan, Dec. 25, 1980, 55-182900
Int. Cl.³ B65H *45/20*
U.S. Cl. 493—414 **11 Claims**

1. An apparatus for stacking a tape of indefinite length in folded condition comprising a machine base; frames secured on said base; a tape accumulation box mounted on said base and having lateral width-wise adjacent half spaces in said box; means supported on said frames above said box for traversing tape supplied from a source in the lateral width direction of said box; means for feeding the tape from said source into the apparatus; means supported on said frames above said box for shaking tape supplied from said tape feeding means off in a longitudinal depth direction of said box, laterally transverse to said width direction, to thereby stack the tape in folded condition in said box; said apparatus being characterized by means comprising a pair of pivotable pressure plates; means for pivoting said pressure plates to alternately intermittently press down on the top of said tape stack respectively in one half space and the other half space in said box while stacking of said tape occurs in the corresponding opposed half space when the height of the tape stack is above the top of said box to thereby

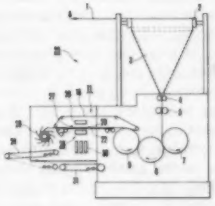


gradually compress the tape stack in said box as said tape is being stacked.

4,427,405
SIGNATURE TRANSFER DEVICE IN A FOLDER FOR A ROTARY PRINTING PRESS

Toshio Hoshi, Toride, Japan, assignor to Komori Printing Machinery Co., Ltd., Japan

Filed May 10, 1982, Ser. No. 376,321
Claims priority, application Japan, May 15, 1981, 56-72925
Int. Cl.³ B65H *45/18*, *45/16*
U.S. Cl. 493—444 **8 Claims**



1. A signature transfer device in a folder for a rotary printing press, comprising:

a rotatable jaw cylinder for gripping and supplying signatures one at a time;

a plurality of upper rollers;

a plurality of upper continuous tapes extending around said plurality of upper rollers in a substantially horizontal orientation and having front ends held against peripheral surfaces of said rotatable jaw cylinder and rear ends located remotely from said rotatable jaw cylinder;

a plurality of lower rollers;

a plurality of lower continuous tapes extending around said plurality of lower rollers closely in parallel relationship to and disposed below said upper continuous tapes, and having front ends located adjacent to said rotatable jaw cylinder and rear ends located remotely from said rotatable jaw cylinder, said upper and lower continuous tapes jointly defining therebetween a signature transfer path along which a signature supplied from said rotatable jaw cylinder can travel, said lower rollers around which said front ends of said lower continuous tapes extend being disposed adjacent to said rotatable jaw cylinder downstream thereof relative to said signature transfer path, the peripheral surface of said last-mentioned lower rollers being positioned higher than said peripheral surface of

said rotatable jaw cylinder in abutting engagement with said upper continuous tapes;

a chopper folder disposed along said signature transfer path for folding a signature as transferred therealong;

a plurality of front lays disposed in said signature transfer path for stopping said signature at a folding location and located downstream of said chopper folder relative to said signature transfer path;

a plurality of adjustable-pressure rollers disposed upstream of said chopper folder for resiliently acting on said upper continuous tapes at a position corresponding to a trailing edge of said signature as it is about to be stopped by said front lays in a position in which said signature can be folded on itself by said chopper folder; and

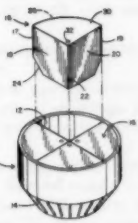
an adjustment mechanism disposed adjacent to said rear ends of said upper and lower continuous tapes for moving said rear ends of said upper continuous tapes toward and away from said rear ends of said lower continuous tapes to thereby adjust gaps between said upper and lower continuous tapes to adjust the contact of said upper and lower continuous tapes on said signatures at their respective rear ends.

4,427,406

SECTIONAL SHAPED LINER FOR A CENTRIFUGE ROTOR

Steven T. Nielsen, Sunnyvale, Calif., assignor to Beckman Instruments, Inc., Fullerton, Calif.

Filed Mar. 22, 1982, Ser. No. 360,550
Int. Cl.³ B04B 5/02
U.S. Cl. 494—16 **11 Claims**



1. A sectional shaped centrifuge rotor liner for placement in a single cylindrical cavity of a centrifuge rotor with other similarly shaped liners, said sectional shaped liner comprising:

an apex edge formed by the junction of two walls of said liner, said apex edge of said liner being aligned with the spin axis of said rotor when said liner is placed in said rotor; and

an annular side of said liner positioned adjacent the wall of said rotor cavity farthest from said spin axis, the portion of said liner adjacent said annular side holding more fluid sample than the portion of said liner adjacent said apex edge, so that the majority of the fluid sample within said liner will be displaced at some radial distance from said spin axis of said rotor when said rotor is operating.

4,427,407

CENTRIFUGAL BOWL SEPARATOR

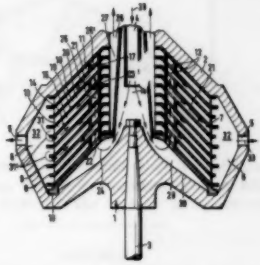
Theodor Paschedag, Beckum, Fed. Rep. of Germany, assignor to Klockner-Humboldt-Deutz AG, Fed. Rep. of Germany

Filed Dec. 2, 1981, Ser. No. 326,707
Claims priority, application Fed. Rep. of Germany, Dec. 4, 1980, 3045672
Int. Cl.³ B04B 1/08
U.S. Cl. 494—70 **14 Claims**

11. A centrifuge bowl separator for separating substances with different densities, comprising:

a rotatably supported hollow housing having a form which is symmetrical about its rotational axis, having an axial inlet for the substances to be separated, a peripherally disposed outlet for the denser substances, and a central outlet for the less dense substances; and

a packet of axially spaced conical discs communicating said inlet with said outlets, and including a series of feed discs having an intermediate disc beneath each said feed disc, the spaces between said discs having a conductive connection to one another only in a radially outer area with respect to the axis of rotation, and there being channels



extending through said discs that communicate said inlet only into the spaces lying at the upper sides of said feed discs, said channels including

an opening in each said disc for each channel;

a pipe connecting said opening in each intermediate disc to said opening in each feed disc disposed immediately thereabove; and

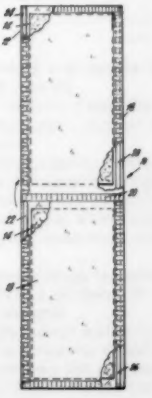
an annular wall connecting each feed disc to each intermediate disc disposed immediately thereabove, said wall lying between said openings and the rotational axis.

4,427,408

DISPOSABLE PANTY AND METHOD

Hamzeh Karami, Tilff; Claude Haulait, Romsee, and Terence Cooper, Embourg, all of Belgium, assignors to Colgate-Palmolive Company, New York, N.Y.

Filed Dec. 8, 1981, Ser. No. 328,771
Int. Cl.³ A41B 9/04
U.S. Cl. 604—393 **7 Claims**



1. A disposable panty comprising an impervious backing sheet, a facing sheet and a pair of spaced absorbent pads placed between said facing and backing sheets, said facing sheet being bonded to said backing sheet ab out its periphery and between

said pads to form front and back panels, said panels being folded between said pads and having their free ends bonded to each other, said panels each having two elasticized strips bonded along the sides thereof, one pair of elasticized strips forming a waist band, said panels being attached to each other at a crotch location medial the ends thereof and adjacent the other pair of elasticized strips to form thigh holes and a pair of crotch seals to extend about the thighs of the wearers.

4,427,409

METHOD FOR PREPARATION OF FABRICS

Razmic S. Gregorian, Akiken, and Chettoor G. Namboodri, North Augusta, both of S.C., assignors to United Merchants and Manufactures, Inc., New York, N.Y.

Filed Jun. 14, 1982, Ser. No. 388,254

The portion of the term of this patent subsequent to Oct. 3, 1995, has been disclaimed.

Int. Cl.³ D06L *1/14, 3/00;* D01C *3/02*

U.S. Cl. 8—107 6 Claims

1. A method for desizing a textile fabric comprising foaming a mixture composed of water, a desizing agent and a foam system to a blow ratio in the range from about 2:1 to 30:1 and a foam density in the range from about 0.5 g/cc to 0.033 g/cc, applying a layer of the foam having a uniform thickness onto the surface of the fabric to be desized in an amount to be effective to desize the fabric, collapsing the foam so that it penetrates into the fabric, batching or steaming the thus treated fabric for a period of time sufficient to allow the desizing agent to separate the size from the fabric and rinsing the fabric.

4,427,410

FABRIC SOFTENING COMPOSITION CONTAINING MOLECULAR SIEVE ZEOLITE

William Chirash, New Providence, and Harold E. Wixon, New Brunswick, both of N.J., assignors to Colgate-Palmolive Company, New York, N.Y.

Continuation of Ser. No. 92,846, Nov. 9, 1979, abandoned, which is a division of Ser. No. 785,474, Apr. 7, 1977, abandoned, which is a continuation of Ser. No. 683,973, May 6, 1976, abandoned, which is a continuation of Ser. No. 503,735, Sep. 5, 1974, abandoned. This application Jan. 11, 1982, Ser. No. 338,614

Int. Cl.³ C11D *1/62, 1/65, 3/12;* D06M *13/46*

U.S. Cl. 8—137 1 Claim

1. A method of simultaneously laundering and softening fabrics, which comprises:

agitating said fabrics in an aqueous medium containing about 0.28 percent by weight of an anionic detergent composition and about 0.14 percent by weight of a softening composition;

said anionic detergent composition comprising in weight percents relative to the total weight of the anionic detergent composition, about 10% sodium linear tridecyl benzene sulfonate, about 2% of a nonionic polyethoxylated fatty alcohol surfactant formed by condensation of a C14 to C15 fatty alcohol and an average of 11 ethyleneoxides per molecule, about 1% of a mixed sodium coconut/tallow fatty acid soap in a weight ratio of 20:80, about 33% of pentasodium tripolyphosphate, about 7% of sodium silicate (Na_2O:SiO_2 ratio being 1:2.35), about 0.5% of sodium carboxymethylcellulose, about 38% sodium sulfate, about 7% moisture and a minor amount of optical brightener and perfume;

said softener composition comprising in weight percents relative to the total weight of the softener composition, about 20% of distearyl dimethyl ammonium chloride, about 40% of a type 4A sodium molecular sieve zeolite having a mean particle diameter of 5.9 to 6.4 microns and containing about 21% water, and about 40% of sodium perborate.

4,427,411

USE OF 1:2 CHROMIUM OR COBALT COMPLEX DYES FOR DYEING LEATHER OR FURS

Alois Püntener, Rheinfelden, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

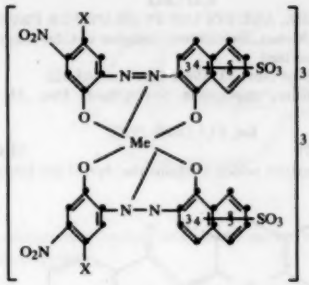
Filed Mar. 19, 1982, Ser. No. 360,032

Claims priority, application Switzerland, Mar. 23, 1981, 1951/81

Int. Cl.³ D06P *1/10, 3/30, 3/32*

U.S. Cl. 8—404 6 Claims

1. A method of dyeing leather or furs, comprising the step of applying thereto a dye composition whose active dyeing ingredient consists essentially of a dye of the formula



in which Me is chromium or cobalt, $Ka^{\oplus}$ is a cation and X is hydrogen, chlorine, methyl or methoxy, and in which the SO_3H groups are located in the 3-, 4-, 5- or 8-positions.

4,427,412

MAGNETIC PRINTING OF DISPERSE-DYEABLE TEXTILE MATERIAL

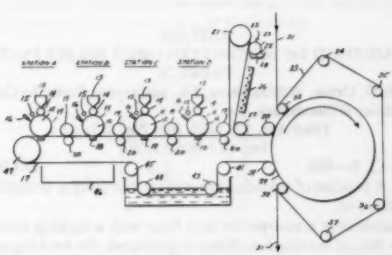
Emery J. Gorondy, Chadds Ford, Pa., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Jun. 28, 1982, Ser. No. 392,786

The portion of the term of this patent subsequent to Dec. 20, 2000, has been disclaimed.

Int. Cl.³ B30B *15/34;* G03G *19/20*

U.S. Cl. 8—471 9 Claims



1. A process for printing a sublimable dye onto a textile material comprising the steps of:

forming a magnetic image in a magnetic imaging member comprising a ferromagnetic material on an electrically conductive support;

developing the magnetic image by applying a ferromagnetic toner comprising a ferromagnetic component, a dye component which is substantially sublimable at from about 160° to 215° C., and a resin which substantially encapsulates the ferromagnetic component and the dye component;

transferring the developed image to a substrate comprising a continuous belt formed of thermally stable, dielectric, non-dye-receptive material;

covering the developed image with a layer of a thermally stable resin which is permeable to said dye component;

then bringing the continuous belt into contact with a textile material to be printed while the belt and fabric are rotated upon a heated drum, with the textile material facing the covering layer of resin of the continuous belt, to thereby transfer said dye component from the continuous belt through the covering layer to the textile material; separating the textile material from the continuous belt; and

removing the resin from the continuous belt.

4,427,413

DYE MIXTURE, AND ITS USE IN TRANSFER PRINTING

Rolf Bäuerle, Riehen, Switzerland, assignor to Ciba-Geigy A.G., Basel, Switzerland

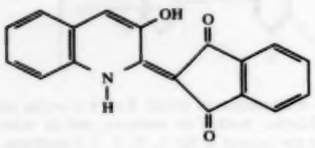
Filed Nov. 23, 1982, Ser. No. 444,023

Claims priority, application Switzerland, Dec. 24, 1981, 8281/81

Int. Cl.³ C09B *29/00*

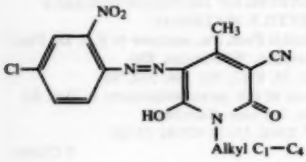
U.S. Cl. 8—471 **11 Claims**

1. A dye mixture which contains the dye of the formula I



(I)

and the dye of the formula II



(II)

and in which the dye of the formula II is present in excess.

4,427,414

METHOD OF MAKING COLORED SHORT PILE FABRICS

Denis G. Orton, Williamsburg, Va., assignor to Badische Corporation, Williamsburg, Va.

Filed Apr. 12, 1982, Ser. No. 367,482

Int. Cl.³ D06P *5/00*

U.S. Cl. 8—480 **10 Claims**

1. A process of manufacturing short pile fabrics, comprising the steps of:

(a) combining a transparent face fiber with a backing material so that an intermediate fabric is produced, the backing material being dyeable with a selected dye and the face fiber being undyeable with the selected dye;

(b) dyeing the intermediate fabric with the selected dye so that a resulting finished short pile fabric has a backing of a first color and a transparent pile fiber of a second color, the backing color differing from the pile fiber color by a ΔC of at least 4 units as measured by the C.I.E.L.A.B. color order system, the combination of the backing and the transparent pile fiber yielding a finished short pile fabric of a third color.

4,427,415

MANIFOLD VACUUM BIOCHEMICAL TEST METHOD AND DEVICE

Patrick H. Cleveland, 4657 Huggins, San Diego, Calif. 92122

Continuation of Ser. No. 1,019, Jan. 5, 1979, abandoned. This application Jan. 29, 1981, Ser. No. 229,502

Int. Cl.³ B01D *25/04, 37/00*; G01N *33/56*

U.S. Cl. 436—57 **8 Claims**

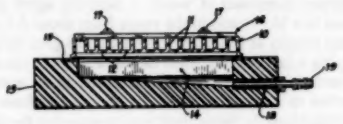
2. A method of entrapping a substance suspended in a liquid medium for sequential reaction and washing steps comprising:

a. placing a filter medium in a manifold test container consisting of a plurality of wells, each with an outlet hole at its lower surface, said hole of such size that surface tension of the liquid medium will prevent flow at normal atmospheric pressure,

b. placing a liquid test sample in each said well,

c. applying a vacuum to the outlet hole sufficient to break the surface tension of the liquid carrier drawing the liquid through the filter medium and the outlet hole depositing suspended particles on the filter medium,

d. placing reactive agents in each said well for test operation on each said test sample,



e. again applying a vacuum to withdraw liquid and deposit particulate matter on the filter,

f. placing cleansing agents in each said well for washing operation of each sample,

g. again applying a vacuum to withdraw the liquid and deposit particulate matter on the filter medium,

h. analyzing the particulate residue on the filter medium following the final vacuum withdrawal of liquid.

4,427,416

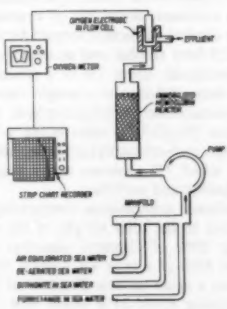
PROCESSES FOR EXTRACTING OXYGEN FROM FLUIDS USING IMMOBILIZED HEMOGLOBIN

Joseph Bonaventura, and Celia Bonaventura, both of Beaufort, N.C., assignors to Duke University, Durham, N.C.

Division of Ser. No. 196,036, Oct. 10, 1980, Pat. No. 4,343,715. This application Apr. 27, 1982, Ser. No. 372,338

Int. Cl.³ C01B *13/00*

U.S. Cl. 23—293 R **21 Claims**



1. A method of recovering dissolved oxygen from fluids comprising:

(1) contacting the fluid containing dissolved oxygen with an oxygen carrier, capable of reversibly binding and releasing oxygen, which has been immobilized in a polymer matrix selected from the group consisting of compounds having urethane linkage, acrylic gels, maleic anhydride containing polymers, epoxy type polymers, glutaronic aldehyde type polymers and mixtures thereof;

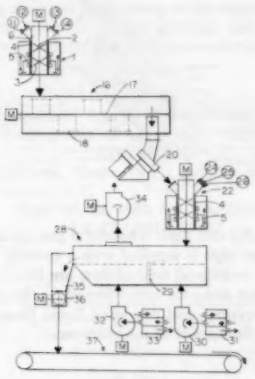
(2) releasing the oxygen absorbed by the oxygen carrier and recovering said released oxygen; and

repeating the steps (1) and (2).

4,427,417
PROCESS FOR PREPARING DETERGENT COMPOSITIONS CONTAINING HYDRATED INORGANIC SALTS

Paul A. Porasik, Southfield, Mich., assignor to The Korex Company, Wixom, Mich.

Filed Jan. 20, 1982, Ser. No. 341,130
Int. Cl.³ B01J 2/10, 2/16; C11D 11/00, 17/06
U.S. Cl. 23—313 R 17 Claims



1. A continuous process for agglomerating and hydrating an anhydrous hydratable detergent salt which comprises continuously feeding and agglomerating particles of a hydratable detergent salt by turbulently dispersing said salt particles into an inert gaseous medium while wetting the dispersed particles with an atomized stream of water metered to provide at least a stoichiometric amount of water but not in excess of about 20% over said stoichiometric amount for hydration of the turbulently dispersed salt particles, depositing the resultant wet agglomerated salt particles into a closed container, retaining the agglomerated particles in said container until they have been substantially hydrated to a degree of hydration between 70% and 100% of theoretical while continuously gently stirring the agglomerates to prevent formation of oversize agglomerates, discharging the substantially hydrated agglomerates from said container and then drying the hydrated agglomerates to a free moisture content less than 5 percent by weight.

4,427,418
DEVICE FOR COLLECTING PARTICULATES IN EXHAUST GASES

Takeshi Kogiso, and Hiroshi Ohkawa, both of Aichi, Japan, assignors to Kabushiki Kaisha Toyota Chuo Kenkyusho, Japan

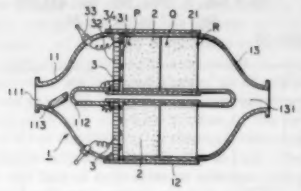
Filed Mar. 9, 1982, Ser. No. 356,289
Claims priority, application Japan, Mar. 16, 1981, 56-38442
Int. Cl.³ B01D 39/20; F01N 3/02, 3/36
U.S. Cl. 55—287 19 Claims

1. A device for collecting particulates in exhaust gases from an internal combustion engine comprising:

a casing having an inlet port and a discharge port for introducing and discharging said exhaust gases;

at least one trapper of porous and heat resistant material disposed within said casing between said inlet and discharge ports, for collecting particulates in said exhaust gases; and

a plurality of electric resistance heaters to facilitate ignition and burning of particulates collected in said at least one trapper, the heaters being separately disposed a predetermined distance apart from each other substantially in contact with a surface of said at least one trapper which confronts said inlet port and connected to a power source such that they are successively energized one by one, each of said plurality of electric resistance heaters having a



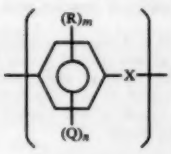
predetermined heating area on said surface of said at least one trapper.

4,427,419
SEMIPERMEABLE MEMBRANES PREPARED FROM POLYMERS CONTAINING PENDENT SULFONE GROUPS

George S. Li, Macedonia, Ohio, assignor to The Standard Oil Company, Cleveland, Ohio

Filed Mar. 12, 1982, Ser. No. 357,366
Int. Cl.³ B01D 53/22
U.S. Cl. 55—16 10 Claims

1. A semipermeable membrane useful for separating a gaseous mixture of CO_2 and CH_4 into enriched fractions of each, the membrane formed from at least one polymer containing a preponderance of arylene units of the formula



(I)

where

each R is independently a C_1–C_8 aliphatic or a C_5–C_7 cycloaliphatic hydrocarbon radical, an aryl radical, an aralkyl radical or an alkaryl radical, each radical being free of a tertiary α-carbon atom;

each Q is a radical of the formula

(II)

where R′ is a nonpolymeric aryl radical;

X is a divalent oxygen or sulfur atom or a carbonate group;

m is an integer of 0–2; and

n is 0–1 with the proviso that n is 1 in at least 10 percent of the arylene units of the polymer.

10. A process of separating a gaseous mixture of CO_2 and CH_4 into enriched fractions of each, the process comprising contacting the mixture with one side of the membrane of claim 1 in such a manner that the CO_2 portion of the mixture is selectively passed through the membrane while the CH_4 portion of the mixture is selectively rejected by the membrane.

4,427,420

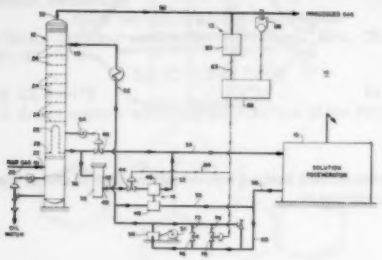
PUMPING METHOD AND APPARATUS

Laurance S. Reid, 601 Broad La., Norman, Okla. 73069

Filed Sep. 3, 1982, Ser. No. 414,631

Int. Cl.³ B01D *53/14*

U.S. Cl. 55—18 **12 Claims**



6. A method of continuous gas-liquid mass transfer or reaction comprising:

directing a feed gas, under pressure, into a lower portion of a gas-liquid contact device and directing a liquid, under pressure, into an upper portion of said contact device to cause intimate contact and mass transfer or reaction between said gas and liquid within said contact device and to form a dilute or reacted liquid and a processed gas, under pressure, collected from said contact device;

directing at least a portion of said dilute liquid, under pressure, from said contact device into the power cylinder of a fluid-powered pump to substantially completely flood said power cylinder with dilute liquid;

directing said dilute liquid from an exit of said power cylinder into a regeneration means, said regeneration means being at a pressure lower than the pressure of said contact device;

treating said dilute liquid in said regeneration means to regenerate said dilute liquid to a degree sufficient to achieve additional mass transfer or reaction with feed gas in said contact device;

pumping a portion of said regenerated liquid from said regeneration means to said contact device through a pump cylinder of said fluid-powered pump; and

pumping another portion of said regenerated liquid from said regeneration means to said contact device with an externally-powered pump.

4,427,421

DEVICE FOR SEPARATING GAS OUT OF LIQUIDS

Niels D. Jensen; Kurt F. Nielsen, both of Bjerringbro, Denmark, and Horst Komossa, Wittenborn, Fed. Rep. of Germany, assignors to Grundfos A/S, Bjerringbro, Denmark

Filed Sep. 1, 1981, Ser. No. 298,386

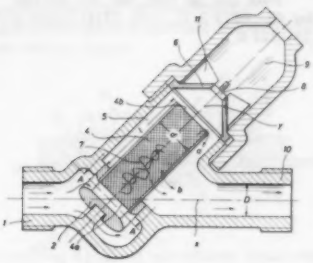
Claims priority, application Fed. Rep. of Germany, Sep. 5, 1980, 3033450

Int. Cl.³ B01D *19/00*

U.S. Cl. 55—52 **19 Claims**

1. A method of separating gas from a gas containing liquid comprising the steps of passing the gas containing liquid in a twisting motion through a sieve tube in a separator chamber wherein the center line of the sieve tube and separator chamber lies at an angle of 45° to the field of gravity of the earth and the dimensions of the sieve tube are chosen so that the axial speed of the liquid in the upper opening of the sieve tube is less than the buoyancy speed of the gas bubbles whereby part of the liquid passes out of the sieve opening of the sieve tube causing the axial component of the speed of flow in the sieve tube to decrease constantly with the flow path.

2. A device for separating gas bubbles from a liquid, said device comprising an entry pipe, and an exit pipe having a common center line, a separator chamber situated between said entry pipe and said exit pipe, a twist generating means located within said chamber and a stationary sieve tube arranged coaxially in said chamber, wherein the upper opening of the sieve tube is directed towards an outlet opening for the gas and connects the sieve tube in primary connection with the exit pipe and wherein the sieve tube piercings form a secondary



connection to the exit pipe, whereby a gas-containing liquid entering the exit pipe is supplied with a twisting motion, gas bubbles in the centrifugal field of flow are forced toward the center of rotation along the center line of the chamber and pass to the outlet opening, and de-gassed liquid flows to the exit pipe at the circumference of the chamber.

4,427,422

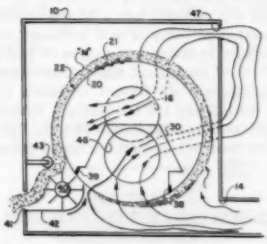
METHOD FOR FILTERING PARTICULATES FROM A FLUID

Kurt W. Niederer, Charlotte, N.C., assignor to Terrell Machine Company, Charlotte, N.C.

Continuation of Ser. No. 241,826, Mar. 9, 1981, Pat. No. 4,360,369. This application Sep. 30, 1982, Ser. No. 430,062

Int. Cl.³ B01D *46/04*

U.S. Cl. 55—96 **4 Claims**



1. A method of separating entrained particulate matter from a conveying fluid, comprising the steps of:

(a) defining a filter making zone within an enclosed housing by a fluid flow into a fluid inlet and through a first pre-determined part of a filter support from the upstream to the downstream side thereof;

(b) defining a filtration zone within said enclosed housing by a fluid flow through a second pre-determined part of said filter support from the upstream to the downstream side thereof and through a fluid outlet;

(c) positioning a chamber means defined by walls on the downstream side of said filter support at said filter making zone and sealingly engaging the downstream side of said filter support against fluid flow therebetween on the downstream side of said filter support;

(d) permitting free fluid flow between the filter making zone and filtration zone on the upstream side of said filter support;

(e) directing a particulate-containing fluid through the filter

support within the filter making zone of the enclosed housing;

(f) collecting at least some of the particulate matter from the particulate containing fluid in an overlying porous layer on the upstream side of the filter support to form a filter medium of enhanced filtering capacity;

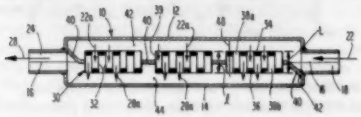
(g) moving the overlying porous layer into the filtration zone of the enclosed housing when the porous layer reaches a thickness and density providing enhanced filtration efficiency; and,

(h) conveying fluid from the downstream side of said filter making zone into the housing on the upstream side of said filtration zone for passage through said filtration zone from the upstream side to the downstream side thereof.

4,427,423
HIGH ASPECT RATIO SOLID PARTICULATE FILTERING APPARATUS AND METHOD OF FILTERING

Max R. Montierth, Elmira, N.Y., assignor to Corning Glass Works, Corning, N.Y.

Filed Feb. 22, 1982, Ser. No. 350,997
Int. Cl.³ B01D *39/20*
U.S. Cl. 55—97 **8 Claims**



1. In a conduit transporting a fluid contaminated with solid particulates between a source and a disposal point a solid particulate filtering apparatus comprising:

a housing across said conduit having an inlet connected to an upstream portion of the conduit extending from said source and an outlet connected to a downstream portion of the conduit continuing to said disposal point;

a plurality of honeycomb filter elements located in the housing, each element being formed by a multiplicity of interconnected thin walls defining an inlet end face and an opposing outlet end face and a multiplicity of cells extending substantially mutually parallel and longitudinally through the element between the inlet and outlet end faces, an inlet group of the cells being open at the inlet end face and closed near the outlet end face, an outlet group of the cells being closed near the inlet end face and open at the outlet end face, the thin walls having interconnected open porosity of a volume and size sufficient to enable the fluid to flow at least across the narrow dimensions of the thin walls and to prevent at least a significant portion of the solid particulates from passing across or through the thin walls in any direction; and

the elements being positioned in said housing such that the inlet end faces of all of said plurality of elements generally lie in a common plane and are exposed to the contaminated fluid transported to the housing through the upstream portion of the conduit, and the cells of all of the plurality of elements commonly extend substantially mutually parallel to each other, whereby said elements act in parallel to filter said fluid.

6. A method of filtering solid particulates from fluids comprising the steps of:

dividing a conduit carrying the contaminated fluid into an upstream portion and a downstream portion with a partition;

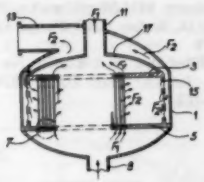
positioning a plurality of honeycomb filter elements through the partition, each element being formed by a multiplicity of thin interconnected walls defining an inlet end face and an opposing outlet end face and a multiplicity of inlet and outlet cells extending between the inlet and outlet end faces, the inlet cells being open at the inlet end face and closed near the outlet end face, the outlet cells being closed near the inlet end face and open at the outlet end face, the thin walls having interconnected open porosity of a volume and size sufficient to enable the fluid to flow at least across the narrow dimensions of the thin walls between adjoining cells and to prevent at least a significant portion of the solid particulates in the exhaust gas from passing entirely across or through the thin walls in any direction, the inlet end faces of all of said plurality of elements generally lying in a common plane and communicating with the upstream portion of the conduit, the cells of all of the plurality of elements commonly extending substantially mutually parallel to each other, and the outlet end face of each element communicating with the downstream portion of the conduit; and

passing the fluid through the conduit and plurality of filters.

4,427,424
ISOTOPE SEPARATION APPARATUS AND PROCESS

Jean Charpin, Paris; Bernard LaRat, Versailles; Raymond Marcel, Breuillet, and Pierre Plurien, Palaiseau, all of France, assignors to Commissariat a l'Energie Atomique, Paris, France

Filed Dec. 2, 1980, Ser. No. 212,138
Claims priority, application France, Dec. 17, 1979, 79 30862
Int. Cl.³ B01D *53/22*
U.S. Cl. 55—158 **22 Claims**



1. A gaseous isotope separation apparatus comprising at least one assembly of microporous capillary tubes having a hydraulic diameter below 0.5 cm, an average pore radius below 200 Å, a thickness between 20 and 500 microns, a porosity between 10 and 60% and a permeability to air between 10.10^{-7} and 100.10^{-7} mole/cm².min. cm of mercury, the assembly of the microporous tubes being constituted by microporous tubes arranged parallel to one another and forming in said assembly a first series of ducts, called first ducts, defined by the inner wall of the tubes, said assembly having a plurality of longitudinal partitions integral with at least certain of the tubes and distributed between the tubes so as to define with the outer wall of the latter a second series of ducts, called second ducts, parallel to the first ducts, means for circulating a gaseous mixture to be separated through said tubes, said means causing said mixture to flow through said tubes in a laminar or near laminar manner, and further means for collecting the gas which has passed through the walls of the capillary tubes of each assembly.

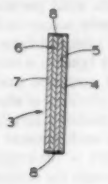
4,427,425
SURGICAL DRAINAGE BAGS

Peter J. Briggs, Sompting, and Steven Carpenter, Chichester, both of England, assignors to Matburn (Holdings) Limited, London, England

Continuation of Ser. No. 248,860, Mar. 30, 1981, abandoned. This application Oct. 26, 1982, Ser. No. 436,724
Claims priority, application United Kingdom, Mar. 31, 1980, 8010778; Feb. 27, 1981, 8106228
Int. Cl.³ B01D *19/00*
U.S. Cl. 55—159 **9 Claims**

1. A filter for a surgical drainage bag comprising a filter layer of activated carbon cloth through which gases may pass

from the interior of the bag, a first layer of gas permeable thermoplastic material in contact with one side of the filter layer, a barrier layer of gas permeable hydrophobic material having one side in contact with said first layer, said hydrophobic material being constructed of a material that is substantially



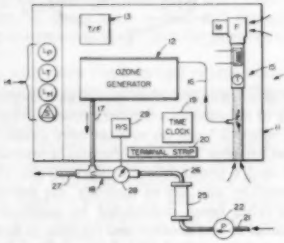
impervious to liquid discharged from a stoma and permitting adequate flow of gas at a pressure of 150 mm of water or less, a second layer of gas permeable thermoplastic material having one side in contact with the other side of the barrier layer, and a peripheral seal extending through all of said layers to secure together said layers.

4,427,426

OZONIZER SYSTEM

Ronald G. Johnson, 1016 Murchison Dr., Millbrae, Calif. 94030, and Monte D. Barber, 5330 Tioago La., Diamond Springs, Calif. 95679

Filed Jun. 28, 1982, Ser. No. 393,039
Int. Cl.³ B01D *53/02*; C02B *3/08*
U.S. Cl. 55—162 **5 Claims**



4. An ozonizing system comprising:

(a) an ozonizer unit in the form of a pair of electrodes spaced apart to provide a space for corona discharge, such unit having an air inlet and an air outlet whereby air introduced through the inlet passes through the space between the electrodes and then through the outlet,

(b) an air dryer having an inlet communicating with the atmosphere and an outlet communicating with the inlet of the ozonizer unit, said air dryer containing a body of dessicant material,

(c) a means connecting the dryer outlet with the ozonizer inlet,

(d) a suction device having a water inlet, a water outlet and a suction passage connected to the ozonizer outlet whereby, when water is passed through the suction device from its inlet to its outlet, it acts to draw air by suction from the inlet of the air dryer through the dessicant material, through the outlet of the air dryer and the connection between such outlet and the ozonizer inlet, then through the space in the ozonizer between the electrodes and through the ozonizer outlet into the suction device,

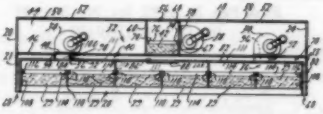
(e) hot air blower means connected to said air dryer and functioning, when actuated, to blow hot air through the dessicant material in the air dryer and through the inlet thereof to the atmosphere, and

(f) timing and control means acting to cause a cyclic operation comprising (1) an ozonizing phase during which air is drawn in through the air dryer inlet, the dessicant material, the ozonizer unit and (2) into the suction device and a drying phase during which the suction device is inactivated, the air blower is activated and causes hot air to pass through the dessicant material to the air dryer inlet, thence to the atmosphere, thereby drying the dessicant material.

4,427,427

VERTICAL LAMINAR FLOW FILTER MODULE

Francisco DeVecchi, Farmington Hills, Mich., assignor to Veco S.A., Cuernavaca, Mexico

Filed Jan. 19, 1982, Ser. No. 340,636
Int. Cl.³ B01D *46/10*; F23J *11/00*
U.S. Cl. 55—358 **22 Claims**

1. A vertical laminar flow filter module comprising:

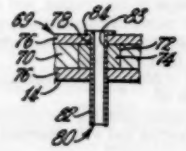
a filter module box having open ends and a permeable filter means substantially closing off the bottom of said box but allowing for the passage of air therethrough, means for supporting said filter module box above a surface, nozzle means for adjustably delivering a curtain of air with varying outward horizontal directional components substantially downward around the perimeter of said permeable filter means to define a work area, and air supply means for supplying air of differential velocities to said permeable filter means and to said nozzle means so that air can be directed downward as laminar flow from said permeable filter means and air can be directed from said nozzle means as a curtain surrounding the laminar flow of air over said work area.

4,427,428

FEEDER FOR FORMING GLASS FIBERS AND METHOD FOR MAKING FEEDER

Mohinder S. Bhatti, and Alfred Marzocchi, both of Newark, Ohio, assignors to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Continuation of Ser. No. 200,650, Oct. 27, 1980, Pat. No. 4,348,216. This application May 14, 1982, Ser. No. 378,050
The portion of the term of this patent subsequent to Sep. 7, 1999, has been disclaimed.
Int. Cl.³ C03B *37/095*
U.S. Cl. 65—1 **13 Claims**



1. A feeder for supplying streams of molten glass to be attenuated into filaments comprising:

a plurality of layers of material wherein one of said layers is a refractory metal and another of said layers is an oxygen impervious, precious metal, said plurality of layers being

intimately bonded together by the application of isostatic pressure and heat to form a unitary laminate, said laminate having a plurality of apertures extending therethrough; and a plurality of elements bonded to the laminate and positioned in said apertures to prevent the oxidation of the refractory metal at elevated temperatures, said elements having (a) an orifice adapted to permit the molten glass to flow therethrough to provide said streams of molten glass and (b) an end surface bonded to the innermost surface of the precious metal layer.

4,427,429

METHOD FOR THE OPALIZATION OF GLASS

Antero Tiilikka, Riihimäki, Finland, assignor to Riihimäen Lasi Oy, Riihimäki, Finland

Filed Apr. 12, 1982, Ser. No. 367,799
Claims priority, application Finland, Apr. 15, 1981, 811168
Int. Cl.³ C03B *5/18, 5/23;* C03C *1/04*
U.S. Cl. 65—33 **12 Claims**

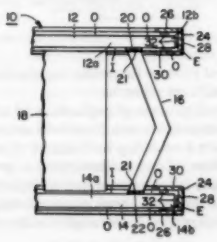
1. A method for the opalization of flint or coloured packaging and household glass to be used in an automatic forming machine, comprising feeding molten base glass from a glass furnace to a forehearth situated between the furnace and the forming machine, maintaining the base glass in the forehearth at a temperature of at least about 1300° C., adding 10–20% by weight of an opalescent agent into the base glass, dissolving the opalescent agent in the base glass under continuous stirring, lowering the temperature of the glass to a temperature not less than about 1100° C. for a period of time sufficient to cause opalization, and feeding the glass to the forming machine.

4,427,430

METHOD CONTROLLING THERMAL GRADIENTS IN GLASS

Roger A. Allaire, Big Flats, and Edwin J. Simonson, Bath, both of N.Y., assignors to Corning Glass Works, Corning, N.Y.

Filed Mar. 25, 1982, Ser. No. 361,557
Int. Cl.³ C03B *23/207*
U.S. Cl. 65—41 **3 Claims**



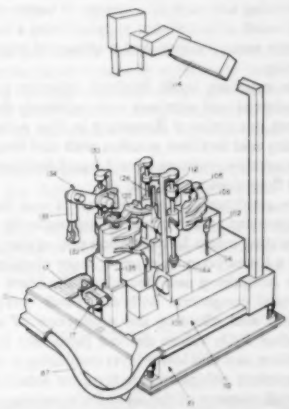
1. In the process of thermally frit sealing glass members together for forming a structure wherein portions of at least some of said glass members are exposed to thermal energy on opposite surfaces thereof while remaining portions of such glass members have only one surface exposed to such thermal energy and wherein various portions of such members are heated to different temperatures by such thermal energy thereby producing detrimental thermal gradients within the structure, a method of inhibiting the formation of such detrimental thermal gradients within such structure which comprises, assembling the glass members to be frit sealed together with frit material between sealing junctions thereof, positioning metal radiation shielding means over at least one of the opposed surfaces of those portions of said members which are exposed to thermal energy on opposite surfaces so as to overlie virtually all of at least one of said opposed surfaces, maintaining said shielding means in spaced relationship from such opposed surfaces, and applying thermal energy to said members and frit sealing the same together along their junctions, while simultaneously shielding from said thermal energy virtually all of at least one surface of those portions of said glass members which would otherwise be exposed on opposite surfaces to such thermal energy, whereby the formation of detrimental thermal gradients within the structure formed by said glass members during the application of said thermal energy is inhibited.

4,427,431

ELECTRONIC CONTROL OF A GLASS FORMING MACHINE

Eustace H. Mumford, Ottawa Lake, Mich., and Jack I. Perry, Sylvania, Ohio, assignors to Owens-Illinois, Inc., Toledo, Ohio

Continuation of Ser. No. 249,280, Mar. 30, 1981, abandoned.
This application Sep. 29, 1982, Ser. No. 426,508
Int. Cl.³ C03B *9/44, 35/00*
U.S. Cl. 65—163 **11 Claims**



1. Apparatus for transferring glass articles from a plurality of sections of a multiple section glass forming machine comprising:

a conveyor, common to all of the sections of the forming machine, for carrying formed articles away from the section;

a sweepout head at each section positioned adjacent the conveyor;

a vertical shaft connected to each said head;

a reversible, electric motor having a rotor and stator, said rotor, surrounding and coupled to said shaft;

a tachometer having its rotor fixed to said shaft and positioned below said motor;

a resolver coupled to said shaft; and

a programmable controller electrically interconnecting each said motor, tachometer and resolver for controlling the rotation of each said shaft to move each head through an angle of less than 180° of rotation and return.

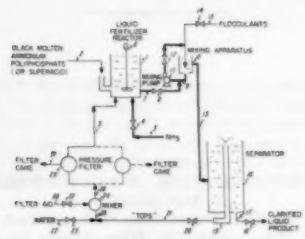
4,427,432
CLARIFICATION OF BLACK AMMONIUM POLYPHOSPHATE LIQUIDS—RECYCLING OF BYPRODUCT "TOPS"

Horace C. Mann, Jr., Killen, and Kenneth E. McGill, Sheffield, both of Ala., assignors to Tennessee Valley Authority, Muscle Shoals, Ala.

Continuation of Ser. No. 232,926, Feb. 9, 1981, abandoned, which is a continuation of Ser. No. 194,304, Oct. 6, 1980, Pat. No. T100,805. This application Aug. 12, 1982, Ser. No. 407,526

Int. Cl.³ C05P 7/00

U.S. Cl. 71—34 **5 Claims**



1. In an improved process for preparing clarified ammonium polyphosphate fertilizer solutions wherein:

(a) a stream of ammonium polyphosphate melt, prepared from black wet-process phosphoric acid and ammonia, is introduced into liquid fertilizer dissolution means for dissolving said melt in a stream of water of formulation, said water of formulation supplied from a later-mentioned filtrate recovery step, and a stream of supplemental ammonia;

(b) the resulting liquid fertilizer solution is subsequently transferred and admixed with relatively small predetermined quantities of flocculant in first mixing means for mixing said fertilizer solution with said flocculant;

(c) the resulting mixture of said liquid fertilizer solution and said flocculant is agitated;

(d) the resulting agitated mixture of said liquid fertilizer solution and said flocculant is subsequently transferred to separating means for separating said mixture into an upper and a lower layer, said upper layer containing tops, said tops comprising said flocculant, the black carbonaceous material congeneric with said black wet-process phosphoric acid effecting the production of said melt and residual P_2O_5 values derived from said liquid fertilizer solution, and said lower layer containing a relatively clear ammonium polyphosphate fertilizer solution having substantial amounts of the input P_2O_5 values;

(e) said lower layer of said clarified ammonium polyphosphate solution is subsequently removed to storage from said separating means for separating said upper and lower layers;

the improvement, for both effecting clarification of additional quantities of said black ammonium polyphosphate fertilizer solution produced in said fertilizer dissolution means for dissolving said melt, and for eminently improving the recovery of said residual P_2O_5 values in said tops, which comprises the steps of:

(1) removing said tops from said separating means for separating said upper layer from said lower layer, and introducing same, together with a stream of predetermined amounts of filter aid and water, into second mixing means for mixing said removed tops, said filter aid, and said water, said predetermined quantities of water sufficient such that the ratio of pounds water per pound of tops introduced and mixed in said second mixing means for mixing said tops, filter aid, and water ranges from 1 to 11;

(2) agitating the resulting mixture in said second mixing means for mixing said tops, filter aid, and water;

(3) transferring the resulting agitated mixture in said mixing means for mixing said tops, filter aid and water to filtering means for filtering said resulting agitated mixture;

(4) removing the resulting filter cake to storage from said filtering means for filtering said resulting agitated mixture;

(5) recovering filtrate from said filtering means for filtering said agitated mixture; and

(6) introducing said filtrate recovered in step 5 above into said liquid fertilizer dissolution means for dissolving said melt, as said stream of water of formulation;

said improved process characterized by the fact that greater than about 99 percent of the total P_2O_5 values in the ammonium polyphosphate values fed to said process are recovered in said ammonium polyphosphate fertilizer solution product.

4,427,433
PRODUCTION OF GRANULAR AMMONIUM-POLYPHOSPHATE WITH AN INLINE REACTOR AND DRUM GRANULATOR

Byron R. Parker, and Thomas R. Stumpe, both of Florence, Ala., assignors to Tennessee Valley Authority, Muscle Shoals, Ala.

Continuation of Ser. No. 358,396, Mar. 15, 1982, now Defensive Publication No. T102,601. This application Sep. 3, 1982, Ser. No. 414,689

Int. Cl.³ C05B 1/06

U.S. Cl. 71—34 **1 Claim**

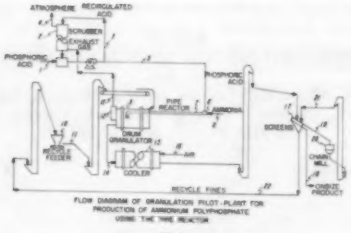


FIG. 1

1. In an improved process for preparing granular ammonium polyphosphate fertilizers wherein

A. a stream of wet-process phosphoric acid and a stream of anhydrous ammonia is introduced into an inline reactor to produce therein a resulting melt reaction product;

B. at least a portion of said molten reaction product is withdrawn from said inline reactor and introduced onto a bed of particulate granular ammonium phosphate fertilizer maintained in a rotating horizontally inclined drum granulator;

C. at least a portion of said material comprising said bed of particulate granular ammonium phosphate fertilizer material maintained in said rotating horizontally inclined drum granulator is removed from said drum granulator and introduced first into cooling means and subsequently into sizing means for product recovery;

D. the off-gases from said drum granulator are passed to scrubbing means wherein the ammoniacal values therein are removed and recovered via a phosphoric acid side stream which is fed back to the main stream of phosphoric acid;

the improvement for effecting a granular ammonium polyphosphate product having a minimum of 12 percent by weight of the P_2O_5 values therein in the form of polyphosphate, said minimum being sufficient to produce an intermediate granular material eminently suitable for the subsequent production of fluid suspension fertilizers having solidification temperatures below about −5° F. and said minimum 12 percent polyphosphate content of said P_2O_5 values being effected without the requirement of the addition of external heat to said inline

reactor and the attendant and ancillary drum granulator, scrubber, and feed and drain lines connecting said reactor, granulator, and scrubber, which improved process comprises the steps of:

(1) reacting said ammonia and said wet-process phosphoric acid in said inline reactor in an NH_3:H_3PO_4 mole ratio ranging from about 1.0 to about 1.25 to thereby provide a total theoretical heat input to said inline reactor ranging between about 795 Btu/lb P_2O_5 and about 902 Btu/lb P_2O_5;

(2) providing predetermined amounts of heat conservation measures to reduce the total heat loss from said pipe reactor, said drum granulator, said scrubber, and the connecting ancillary feed and drain lines therebetween to the range from about 50 to about 157 Btu/lb of P_2O_5, said total heat loss values being in dependent and proportional relationship to said values of total theoretical heat input in step (1) above, to thereby provide a net heat input to said inline reactor of at least 795 Btu/lb of P_2O_5; said predetermined amounts of heat conservation measures in the form of insulation over the heat exchange surfaces of said pipe reactor, said drum granulator, said scrubber, and said attendant and ancillary feed and drain lines therebetween being determined by the equation below:

$$x = \frac{k[A_1(T_1 - T_A) + A_2(T_2 - T_A) + A_3(T_3 - T_A)]}{Q_L \cdot P \cdot w_{P_2O_5}}$$

where

Q_L=allowable heat loss as shown in FIG. 5, Btu/lb P_2O_5

P=production rate of product, lb/h

$w_{P_2O_5}$=weight fraction of P_2O_5 in product

k=thermal conductivity of insulation, Btu/(hr-ft^2-°F./inch thickness)

x=thickness of insulation, in.

A_1=heat transfer area of scrubber and acid feed and drain piping, ft^2

A_2=heat transfer area of reactor, ft^2

A_3=heat transfer area of granulator, ft^2

T_1=mean temperature of acid in scrubber and flow lines, °F.

T_2=mean temperature of reactor melt, °F.

T_3=mean temperature of granulator, °F.

T_A=ambient temperature; and

(3) recovering as product granular ammonium polyphosphate from said sizing means, said product characterized by the fact that it has a minimum of 12 percent by weight P_2O_5 values therein in the form of polyphosphate, said polyphosphate being sufficient to produce an intermediate granular material eminently suitable for the production of fluid suspension fertilizers having solidification temperatures below about −5° F.

4,427,434

MANUFACTURING AND USING NITROGEN FERTILIZER SOLUTIONS ON A FARM

John A. Eastin, P.O. Box 389, Lincoln, Nebr. 69140

Continuation-in-part of Ser. No. 100,825, Dec. 6, 1979, abandoned, which is a continuation of Ser. No. 824,289, Aug. 15, 1977, abandoned, which is a division of Ser. No. 581,050, May 27, 1975, abandoned. This application May 18, 1982, Ser. No. 379,551

Int. Cl.^{3} C05C *3/00*

U.S. Cl. 71—54 11 Claims

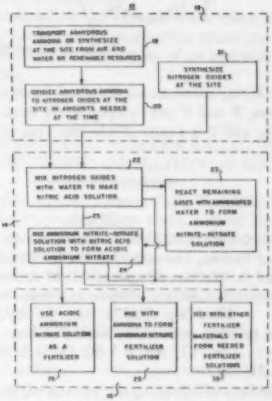
1. A method of nitrogeneous fertilizing of farm lands comprising the steps of:

burning ammonia in air at a rate of less than 60 pounds per hour over a catalyst at a concentration of between 10% and 25% by volume of ammonia to air and at a temperature of between 800 and 2,000 degrees Fahrenheit in a continuous process at a pressure between atmospheric pressure and a vacuum pressure of ¼ of an atmosphere on a farm to be fertilized to form a continuous stream of nitrogen oxides on the farm;

oxidizing the nitrogen oxides to form a molar ratio of nitrogen dioxide to nitric oxide greater than one;

mixing the nitrogen dioxide as the nitrogen dioxide is formed with flowing water from a source on a farm at a rate of less than 12 gallons per minute in a continuous process as the nitrogen dioxide is being formed to result in a dilute solution of nitric acid.

reacting the remaining oxides with ammonium hydroxide in a continuous process within a reactor in a stream flowing in the range of 0.5 to 0.03 gallons each minute of ammoni-


TRANSPORT ANHYDROUS AMMONIA OR SYNTHESIZE AT THE SITE FROM AIR AND WATER OR RENEWABLE RESOURCES
SYNTHESIZE NITROGEN OXIDES AT THE SITE
OXIDIZE ANHYDROUS AMMONIA TO NITROGEN OXIDES AT THE SITE IN AMOUNTS NEEDED AT THE TIME
MIX NITROGEN OXIDES WITH WATER TO MAKE NITRIC ACID SOLUTION
REACT REMAINING GASES WITH AMMONIATED WATER TO FORM AMMONIUM NITRITE-NITRATE SOLUTION
MIX AMMONIUM NITRITE-NITRATE SOLUTION WITH NITRIC ACID SOLUTION TO FORM ACIDIC AMMONIUM NITRATE
USE ACIDIC AMMONIUM NITRATE SOLUTION AS A FERTILIZER
MIX WITH AMMONIA TO FORM AMMONIUM NITRATE FERTILIZER SOLUTION
MIX WITH OTHER FERTILIZER MATERIALS TO FORM MIXED FERTILIZER SOLUTIONS

ated water per square foot of tank cross-section sufficiently ammoniated to provide a pH in the range of 8.0 to 8.4 passing through a mixture of nitrogen oxides in which the ratio of nitric oxide to nitrogen dioxide is greater than 1 to form an ammonium nitrite solution liquid at a pH above 6.7;

mixing the ammonium nitrite rapidly with the nitric acid at a pH of less than 2 to form a dilute solution of liquid nitrogen fertilizer comprising ammonium nitrate; and

using the dilute solution of liquid nitrogen fertilizer in a process leading to and including the application of nitrogenous fertilizer on the farm as the fertilizer is being formed.

4,427,435

USE OF IODOACETAMIDE AND AMINES FOR THE CONTROL OF HARMFUL ORGANISMS, AND AGENTS FOR SUCH CONTROL

Joachim Lorenz, and Reinhardt Grade, both of Bensheim, Fed. Rep. of Germany, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Jun. 10, 1981, Ser. No. 272,425

Claims priority, application Switzerland, Jun. 12, 1980, 4538/80

Int. Cl.^{3} A01N *33/04, 43/64, 37/18*

U.S. Cl. 71—67 9 Claims

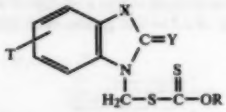
1. A method for combatting harmful bacteria, fungi, yeasts or algae present in an aqueous medium which comprises adding to said medium an effective combatting amount of a combination of from 30–300 ppm of iodoacetamide and from 5–30 ppm of a microbiocidal amine selected from the group consisting of aliphatic amines, hexahydro-s-triazines amines and the corresponding quaternary ammonium compounds, said concentration being based on the aqueous medium.

4,427,436
N-SUBSTITUTED XANTHATE BENZOTHIAZOLINE AND RELATED DERIVATIVES

John J. D'Amico, Creve Coeur, Mo., assignor to Monsanto Company, St. Louis, Mo.

Filed Jul. 12, 1982, Ser. No. 397,617
Int. Cl.³ C07D 277/68, 263/58; A01N 9/12
U.S. Cl. 71—88 36 Claims

1. A compound represented by the formula



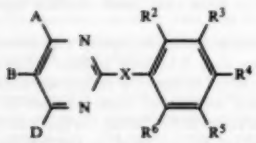
wherein R represents an alkyl radical having from 1 to 3 carbon atoms, X and Y are independently selected from oxygen and sulfur and T is a radical selected from hydrogen and C_{1-4} alkoxy.

4,427,437
USE OF 2-PHENOXYPYRIMIDINES AS HERBICIDES

Alexander Serban, Doncaster; Keith G. Watson, Box Hill, and Richard B. Warner, Ringwood, all of Australia, assignors to ICI Australia Limited, Melbourne, Australia

Filed Sep. 5, 1978, Ser. No. 939,914
Claims priority, application Australia, Sep. 13, 1977, 1626
Int. Cl.³ A01N 5/00; C07D 239/34
U.S. Cl. 71—92 24 Claims

1. A process of inhibiting the growth of, severely damaging, or killing plants which process comprises applying to the plant or to the growth medium thereof an effective amount of a composition comprising as active ingredient a compound of formula I:



I

wherein A and D are independently chosen from the group consisting of hydrogen, halogen, C_1 to C_6 alkyl, C_1 to C_6 haloalkyl, C_1 to C_6 alkoxy, C_1 to C_6 alkylthio, C_1 to C_6(alkoxy)carbonyl and NR^7R^8 wherein R^7 and R^8 are independently chosen from hydrogen and C_1 to C_6 alkyl;

B is chosen from the group consisting of halogen, cyano, C_1 to C_6(alkoxy)carbonyl, C_1 to C_6 alkyl, C_1 to C_6 haloalkyl, C_1 to C_6 alkoxy, NR^7R^8 wherein R^7 and R^8 are independently hydrogen or C_1 to C_6 alkyl, phenyl, halophenyl and nitrophenyl;

R^3 and R^5 are independently chosen from the group consisting of hydrogen, halogen, nitro, cyano, C_1 to C_6 alkyl, C_2 to C_6 alkenyl, C_1 to C_6 haloalkyl, C_1 to C_6 alkoxy, C_1 to C_6 haloalkoxy, C_2 to C_6 alkenyloxy, C_2 to C_6 haloalkenyloxy, C_2 to C_6 alkynyloxy, phenoxy, halophenoxy, benzyloxy and halobenzyloxy, and wherein at least one of R^3 and R^5 is a substituent other than hydrogen;

R^2, R^4 and R^6 are independently chosen from the group consisting of hydrogen, halogen, nitro, cyano, hydroxy, C_1 to C_6 alkyl, C_2 to C_6 alkenyl, C_1 to C_6 haloalkyl, C_1 to C_6 alkoxy, benzyl, phenoxy, halophenoxy, benzyloxy and halobenzyloxy;

X is oxygen;

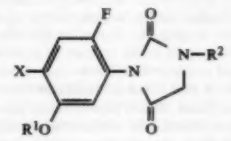
or an acid addition salt thereof; and a carrier therefor.

4,427,438
N-(2-FLUORO-4-HALO-5-SUBSTITUTED PHENYL) HYDANTOINS

Eiki Nagano, Hyogo; Shunichi Hashimoto, Toyonaka; Ryo Yoshida, Kawanishi; Hiroshi Matsumoto, Toyonaka, and Katsuzo Kamoshita, Osaka, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Filed May 28, 1982, Ser. No. 383,293
Claims priority, application Japan, May 29, 1981, 56-83313
Int. Cl.³ A01N 43/50; C07D 233/72
U.S. Cl. 71—92 12 Claims

9. A method for controlling weeds which comprises applying as an active ingredient a herbicidally effective amount of the compound of the formula:



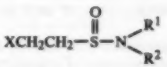
wherein X is a chlorine atom or a bromine atom and R^1 and R^2 are the same or different, and each is a C_1–C_4 alkyl group, a cyclopropyl group, a C_3–C_4 alkenyl group or a C_3–C_4 alkynyl group to the area where the weeds grow or will grow.

4,427,439
COMPOSITION FOR PLANT GROWTH REGULATION

Michael J. Brown, Randolph, N.J., assignor to GAF Corporation, New York, N.Y.

Filed Apr. 28, 1980, Ser. No. 144,502
Int. Cl.³ A01N 43/40, 43/36
U.S. Cl. 11—94 19 Claims

1. A coacting plant growth regulating, ethylene generating composition consisting essentially of a 2-haloethylsulfinamide having the formula:



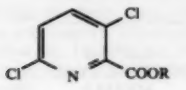
wherein X is a chlorine or bromine atom; R^1 is hydrogen or methyl and R^2 is hydrogen, phenyl, benzyl or alkyl having from 1 to 12 carbon atoms or R^1 and R^2 together with the nitrogen atom form a pyrrolidonyl ring and a N-heterocyclic amide selected from the group consisting of N-methylpyrrolidone, pyrrolidone, N-methyl pyridione, polyvinylpyrrolidone and N-methyl succinimide combined in a mole ratio of between about 1:0.05 and about 1:5.

4,427,440
HERBICIDES BASED ON CYCLOHEXANE-1,3-DIONE DERIVATIVES AND 3,6-DICHLORO-2-PICOLINIC ACID DERIVATIVES

Eckhart von der Osten, Speyer, Fed. Rep. of Germany; James F. Stewart, Cambridge, and John M. Bennett, Willowdale, both of Canada, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Filed Aug. 19, 1981, Ser. No. 294,238
Claims priority, application Fed. Rep. of Germany, Aug. 27, 1980, 3032259
Int. Cl.³ A01N 43/40
U.S. Cl. 71—94 2 Claims

1. A herbicidal agent consisting essentially of a mixture of 2-(1-ethoxyaminobutylidene)-5-(2-ethylthiopropyl)-cyclohexane-1,3-diione (I) or a metal salt, an unsubstituted or substituted ammonium salt, or a hydrate of said compound and a 3,6-dichloro-2-picolinic acid derivative of the formula II



(II)

where R is hydrogen or straight-chain or branched alkyl of 1 to 4 carbon atoms, or a metal salt or unsubstituted or substituted ammonium salt of the acid, wherein the ratio of compound (I) to compound (II) is from 1:0.06 to 1:5.

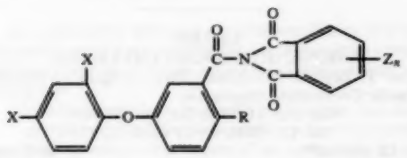
4,427,441

PHTHALIMIDES OF PHENOXYBENZOIC ACIDS

Frank Wu, Libertyville, and Leonard J. Stach, Riverside, both of Ill., assignors to Velsicol Chemical Corporation, Chicago, Ill.

Filed Aug. 23, 1982, Ser. No. 410,679
Int. Cl.³ A01N *43/38*; C07D *209/48*
U.S. Cl. 71—96 10 Claims

1. A compound of the formula



wherein X is chlorine, bromine or trifluoromethyl; Y is selected from the group consisting of hydrogen, chlorine, bromine, nitro and cyano; R is selected from the group consisting of nitro, alkylthio of up to six carbon atoms, chlorine, bromine and cyano; Z is selected from the group consisting of alkyl of up to six carbon atoms, chlorine, bromine and nitro; and n is an integer from 0 to 4.

9. A herbicidal composition comprising an inert carrier and in a quantity toxic to weeds a compound of claim 1.

4,427,442

RECOVERY OF PLATINUM GROUP METALS, GOLD AND SILVER FROM SCRAP

Joseph G. Day, Holmer Green, England, assignor to Johnson Matthey Public Limited, London, England

Filed Feb. 1, 1982, Ser. No. 344,714
Claims priority, application United Kingdom, Feb. 5, 1981, 8103570
Int. Cl.³ C22B *11/02*
U.S. Cl. 75—10 R 15 Claims

1. A process for the recovery of precious metal selected from the group consisting of platinum group metals, silver and gold deposited upon or contained in electronic scrap material containing barium titanate comprising preparing in divided form a charge containing the said scrap material bearing said previous metal and optionally a metallic collector selected from the group consisting of copper and silver, such that at least 2% by weight of precious metal plus any collector metal is present, subjecting the charge to a high intensity plasma arc at a temperature of at least 1400° C. in a high intensity plasma arc furnace to produce a molten metallic phase containing a substantial proportion of the said precious metal and any collector metal and a slag phase containing ceramic residues and the remainder of the metal and separating the two phases.

4,427,443

PROCESS AND APPARATUS FOR AUTOMATING A VACUUM DEGASIFICATION CYCLE FOR METAL ALLOYS

Pierre L. Merrien, Billere, and Pierre A. Merrien, Sceaux, both of France, assignors to Etude et Developpement en Metallurgie, Billere, France

Filed Nov. 26, 1980, Ser. No. 210,622
Claims priority, application France, Nov. 28, 1979, 79 29226
Int. Cl.³ C22B *9/04*
U.S. Cl. 75—68 R 20 Claims

1. A process for automating a degasification cycle for metal alloys under vacuum comprising:

automatically controlling the degasification speed to correspond to predetermined degasification speed parameters independently of the intervention of an operator during said controlling.

4,427,444

METHOD OF REFINING MOLTEN METAL WITH STIRRING BY REPEATED OPERATION OF SUCTION AND DISCHARGE

Norio Sumida; Yukio Oguchi; Tetsuya Fujii; Toshihiko Emi, all of Chiba; Toshio Fujimura; Arata Ueda, both of Kurashiki, and Kenichi Orito, Okayama, all of Japan, assignors to Kawasaki Steel Corporation, Kobe, Japan

Filed Oct. 29, 1982, Ser. No. 437,513
Claims priority, application Japan, Jul. 20, 1982, 57-126281; Jul. 20, 1982, 57-126282; Jul. 20, 1982, 57-126283
Int. Cl.³ C22B *9/00*
U.S. Cl. 75—93 R 11 Claims

1. A method of refining molten metal with stirring by repeated operation of suction and discharge of the molten metal, the method comprising immersing a lower end of a refractory cylinder into a molten metal bath contained in a refining vessel, alternately subjecting the inside of an upper end of the cylinder opposite to the immersed lower end thereof, to pressure reduction and pressurization to forcibly stir the molten metal bath due to repeated suction of the molten metal into the cylinder and rapid discharge thereof, the pressure reduction velocity having predetermined values of not more than 1,000 mmHg/sec at an initial stage of evacuation and not more than 500 mmHg/sec at a later stage of evacuation required for obtaining a predetermined value of vacuum degree of −450 mmHg, and extending evacuation time over a period of at least 1.5 times a period of oscillation of a molten metal column having a predetermined height range in the cylinder.

4,427,445

TUNGSTEN ALLOYS CONTAINING A15 STRUCTURE AND METHOD FOR MAKING SAME

Robert A. Holzl, La Canada; Robert E. Benander, Lakeview Terrace, and Robert D. Davis, Costa Mesa, all of Calif., assignors to Dart Industries, Inc., Northbrook, Ill.

Continuation-in-part of Ser. No. 289,120, Aug. 3, 1981, which is a continuation-in-part of Ser. No. 84,791, Oct. 15, 1979, abandoned. This application Jul. 21, 1982, Ser. No. 399,201
Int. Cl.³ B22F *7/04*
U.S. Cl. 75—234 8 Claims

1. A thermochemically deposited product consisting primarily of a two phase mixture of tungsten and carbon or tungsten, carbon and oxygen, one phase being pure tungsten and the other phase being an A15 structure, said tungsten phase being present in between about twenty percent and ninety percent, said product having a carbon content in said A15 structure phase by weight greater than about 0.1 percent and less than about 1 percent, said carbon content being substantially less than the carbon content corresponding to an A15 structure consisting of W_3C, said product being free of columnar distribution of grains, having a hardness of greater than 1200 VHN, and having an average grain size of less than 0.1 microns.

6. A coated substrate product comprising a metal substrate

having a coating thereon consisting primarily of a two phase mixture of tungsten and carbon or tungsten can carbon and oxygen, one phase being pure tungsten and the other phase being an A15 structure, said tungsten phase being present in between about twenty percent and ninety percent, said coating having a carbon content in said A15 structure phase by weight greater than about 0.1 percent and less than about 1 percent, said carbon content being substantially less than the carbon content corresponding to an A15 structure consisting of W_3C, said product being free of columnar distribution of grains, having a hardness of greater than 1200 VHN, and having an average grain size of less than 0.1 microns.

4,427,446

CORROSION-RESISTANT AND ABRASIVE WEAR-RESISTANT COMPOSITE MATERIAL FOR CENTRIFUGALLY CAST LININGS

Tsuyoshi Miura, Higashihiroshima; Yutaka Arakida, Hiroshima; Yoshikazu Kondo, and Tsuneyuki Ide, both of Kudamatsu, all of Japan, assignors to Japan Steel Works, Ltd. and Toyo Kohan Co., Ltd., both of Tokyo, Japan

Filed Apr. 13, 1981, Ser. No. 253,536
Int. Cl.³ B22F 7/02
U.S. Cl. 75—244 **5 Claims**

1. A corrosion-resistant and abrasive wear-resistant composite material lining for a substrate, said lining formed by centrifugal casting and comprising a metal matrix and reinforcing materials, said matrix selected from the group consisting of a Ni-based self-fluxing alloy and a Co-based self-fluxing alloy, wherein said Ni-based self-fluxing alloy consists of 0.5–4.0% by weight of B 1.0–5.0% by weight of Si, 0.2–1.0% by weight of C, up to 16% by weight of Cr, up to 4% by weight of Fe, and the remainder Ni and wherein said Co-based self-fluxing alloy consists of 0.5–4.0% by weight of B, 1.0–5.0% by weight of Si, 4.0–12% by weight of W, 0.2–1.0% by weight of C, up to 16% by weight of Cr, up to 12% by weight of Ni and the remainder Co; said reinforcing material is selected from the group consisting of chromium boride, iron boride and composite boride wherein said composite boride comprises 3–20% by weight of B, less than 3% by weight of Al, less than 5% by weight of Si, less than 2.5% by weight of oxygen, less than 2.0% by weight of C and at least one metal selected from the group consisting of Cr, Mo, W, Ti, V, Mb, Ta, Hf, Zr, Co, Mi and Mn in the following amounts 0.5–35% by weight of Cr, 0.5–35% by weight of Mo, 1–30% by weight of W and less than 15% by weight of each of Ti, V, Mb, Ta, Hf, Zr, Co, Ni and Mn; the balance being at least 20% by weight of Fe; wherein said reinforcing material substantially congregates at the surface of the lining distant from the substrate.

4,427,447

ALUMINA-YTTRIA MIXED OXIDES IN DISPERSION STRENGTHENED HIGH TEMPERATURE ALLOY POWDERS

Trikur A. Ramanarayanan, Somerset; Ruzica Petkovic-Luton, Englewood, both of N.J., and Raghavan Ayer, Stamford, Conn., assignors to Exxon Research and Engineering Co., Florham Park, N.J.

Filed Mar. 31, 1982, Ser. No. 363,905
Int. Cl.³ C22C 1/05
U.S. Cl. 75—252 **10 Claims**

1. In a metal powder mixture for mechanically alloying into an oxide dispersion strengthened high temperature alloy, which powder mixture contains about 0 to 30 wt. % chromium, about 0 to 3 wt. % titanium, about 0.3 wt. % to 10 wt. % aluminum, about 0.3 wt. % to 10 wt. % oxide dispersoid particles having a negative free energy of formation at 1000° C. of at least as great as that of aluminum oxide, and as a major component a metal selected from the group consisting of iron, nickel, and cobalt; the improvement which comprises the replacement of all or a fraction of the dispersoid particles with particles of one or more alumina-yttria mixed-oxides selected from the group consisting of $Al_2O_3.2Y_2O_3$, $Al_2O_3.Y_2O_3$, and $5Al_2O_3.3Y_2O_3$.

4,427,448

CORROSION INHIBITING COMPOSITIONS FOR METALS

Lenas J. Hedlund, and Viswanadham Puligandla, both of Rochester, Minn., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 7, 1982, Ser. No. 385,582
Int. Cl.³ C09D 5/10
U.S. Cl. 106—14.27 **10 Claims**

1. A corrosion inhibitor comprising:

an amine of the family of aliphatic primary amines where the amine is in the range of 1 to 3 weight percent, with 12 carbons or less in chain length, and is sparingly soluble in oil,

an acid of the family of aliphatic carboxylic acids where the acid is in the 2 to 6 weight percent range and with a 16 to 20 carbon chain, and,

an oil based carrier consisting of a paraffinic oil, kerosene and methyl chloroform for said acid and amine, said acid being in a molar excess to result in a homogeneous composition.

4,427,449

ANIONIC BITUMINOUS EMULSIONS

Walter T. Zdybak, Bellingham, Wash., assignor to Georgia-Pacific Corporation, Atlanta, Ga.

Filed Jun. 11, 1982, Ser. No. 387,512
Int. Cl.³ C08L 95/00; C09D 3/24
U.S. Cl. 106—277 **24 Claims**

1. An oil-in-water anionic bituminous emulsion which comprises from about 30 to about 75 weight percent of the emulsion of bitumen dispersed in an aqueous continuous phase, and from 0.1 to 5 weight percent of an anionic emulsifier prepared by reacting a lignosulfonate with an organic sulfonyl chloride or bromide in which the organic group is selected from the group consisting of benzene, substituted benzene, and an aliphatic hydrocarbon having at least four carbon atoms until at least 30% of the phenolic hydroxyls on the lignosulfonates have been reacted.

4,427,450

CHALKING-RESISTANT, CALCINED KAOLIN CLAY PIGMENT AND METHOD OF MAKING

Edward C. Kostansek, Annandale, N.J., assignor to Engelhard Corporation, Edison, N.J.

Continuation of Ser. No. 175,567, Aug. 4, 1980, abandoned. This application Dec. 2, 1981, Ser. No. 326,630
Int. Cl.³ C09C 1/42
U.S. Cl. 106—288 B **6 Claims**

1. A process for producing a calcined kaolin clay pigment which comprises:

(a) fractionating a hydrous clay to obtain a fine fraction having an average particle size less than about 1 micron, e.s.d., and fractionating the same or a different hydrous clay to obtain a coarse fraction having an average particle size above about 3 microns, e.s.d.,

(b) blending said fine fraction and said coarse fraction of clay such that the resulting blend has an average particle size in the range of about 3 to 10 microns, e.s.d.,

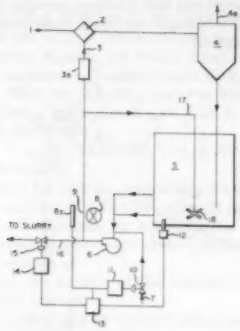
(c) calcining said blended clay under conditions of time and temperature such that said hydrous kaolin clay is substantially dehydrated by passing through the characteristic kaolin endotherm, and

(d) milling said calcined blended clay without reducing average particle size below about 3 microns, e.s.d. until an oil absorption below about 35 g. oil/100 g. clay as determined by ASTM spatula rubout is achieved.

4,427,451
PREPARATION CONCENTRATED TiO_2SLURRIES FROM SPENT STEAM

Michael R. Baloga, Big Sandy, Tenn., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Sep. 17, 1981, Ser. No. 303,044
Int. Cl.³ C09C 1/36
U.S. Cl. 106—300 6 Claims



1. A process for preparing a concentrated slurry of titanium dioxide in water from titanium dioxide tailings from a titanium dioxide fluid energy steam milling micronizer process which comprises

(a) passing spent steam from a TiO_2 micronizer unavoidably carrying with it TiO_2 into a scrubber where it is contacted with a recirculating stream of an aqueous slurry of the micronizer tailings of TiO_2;

(b) separating the TiO_2 and water from the steam;

(c) collecting the separated TiO_2 and water in a vessel in which settling is prevented;

(d) pumping a part of the TiO_2 and water from the vessel as an aqueous slurry to the scrubber with additional water;

(e) continuing the above treatment until the total solids content of the TiO_2 and water slurry from the vessel is 30–70% by weight.

4,427,452
FILLED ELASTOMER COMPOSITIONS

David G. Jeffs, St. Austell, England, assignor to English Clays Lovering Pochin & Company Limited, St. Austell, England

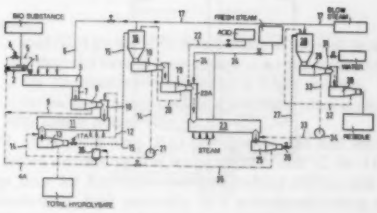
Continuation-in-part of Ser. No. 191,067, Sep. 26, 1980, abandoned. This application Sep. 2, 1982, Ser. No. 414,518
Int. Cl.³ C09C 1/28
U.S. Cl. 106—308 Q 21 Claims

1. A filled elastomer composition which comprises an elastomer and a filler wherein the filler comprises a substantially dehydroxylated clay which contains at least 60% by weight of particles smaller than 2 microns equivalent spherical diameter, has a specific gravity not greater than 2.4 and a specific surface area (as measured by the B.E.T. liquid nitrogen adsorption method) of at least 10 m^2g^{-1} and which has been treated with a substituted silane.

4,427,453
TWO STAGE CONTINUOUS HYDROLYSIS OF PLANT BIOMASS TO SUGARS

Franz J. Reitter, Grovestrasse 13, München, Fed. Rep. of Germany (D-8000 50)

PCT No. PCT/DE81/00036, § 371 Date Oct. 15, 1981, § 102(e) Date Oct. 15, 1981, PCT Pub. No. WO81/02428, PCT Pub. Date Sep. 3, 1981
PCT Filed Feb. 21, 1981, Ser. No. 311,734
Claims priority, application Fed. Rep. of Germany, Feb. 23, 1980, 3006887
Int. Cl.³ C13K 1/02
U.S. Cl. 127—1 28 Claims



19. Apparatus for the continuous hydrolysis of pentosan-containing hemicelluloses, cellulose and corresponding compounds in plant biomass to sugar in which chopped biomass is treated in a first stage in the presence of dilute acid, at temperatures and pressure conditions under which the hemicellulose and, partially, the cellulose are hydrolyzed during a first reaction to pentoses and partially, hexoses, whereupon the reaction mixture pressure is suddenly released and the hydrolysate is separated from the biomass, and in at least a further stage, cellulose in the biomass is hydrolyzed in the presence of dilute mineral acid and under more severe temperature and pressure conditions, to hexoses, whereupon again the reaction mixture pressure is suddenly released and the hydrolysate is separated from the remaining biomass, and in which the neutralized hydrolysate is further processed for the production of sugars, wherein each hydrolysis stage comprises as reaction chamber, a continuously operating horizontal tube digester containing horizontal conveyor devices, the digester being connected on the entrance side with a conical worm filler with a perforated cone casing for the injection of the biomass and the outlet side is fitted with an outlet device which forms a pressure seal for the exit side of the reaction chamber, and which is connected via a blow pipe with a cyclone-shaped blow tank.

4,427,454
METHOD FOR TREATING SUGAR SOLUTION

Yoshiyuki Oyama, Tokyo; Yoshio Matsuo, Chiba, and Hiroaki Nishi, Matsudo, all of Japan, assignors to Riken Vitamin Oil Co., Ltd., Tokyo, Japan

Filed Jun. 8, 1982, Ser. No. 386,217
Claims priority, application Japan, Jun. 26, 1981, 56-99175
Int. Cl.³ C13D 1/00; C13G 1/04
U.S. Cl. 127—44 4 Claims

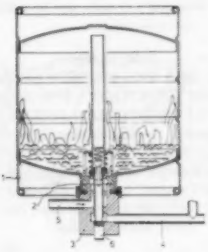
1. A method for treating a sugar solution, comprising adding an ester composition to the sugar solution during a process of manufacturing sugars, in an amount which is sufficient to defoam the sugar solution and reduce its viscosity and which is at least 0.001% of the sugar solution,

wherein the ester composition comprises one, two or more than two kinds of esters selected from the group consisting of glycerol mono-aceto mono-fatty acid ester, glycerol mono-aceto di-fatty acid ester and glycerol di-aceto mono-fatty acid ester, where the esters of the ester composition have a fatty acid of 12 carbons or have mixed fatty acids consisting of at least 40% of a fatty acid of 12 carbons, the rest being fatty acids of 8 to 14 carbons.

4,427,455
BARREL CLEANING METHOD

Manfred Schepper, Herford, Fed. Rep. of Germany, assignor to Leifeld & Lemke Machinenfabrik & Co. GmbH, Rahden, Fed. Rep. of Germany

Filed Feb. 11, 1982, Ser. No. 347,960
Claims priority, application Fed. Rep. of Germany, Jan. 15, 1981, 3101006
Int. Cl.³ B08B 9/12, 9/10
U.S. Cl. 134—22.18 7 Claims



1. A process for the internal cleaning of containers, the containers including a fitting which remains in a first end thereof, the fitting having a riser-pipe projecting into the container and further having at least a pair of passages therethrough, one of the fitting passages communicating with the riser pipe, the fitting also including valves which normally close the said passages, the process comprising the steps of:

introducing a cleaning liquid into the container;

periodically causing turbulence in the cleaning liquid in the container without moving the container by introducing a pressurized fluid into the container at a point below the surface level of the cleaning liquid previously introduced; and

releasing gas from the container at a point above the surface level of the introduced cleaning liquid to thereby limit the pressure in the container to a preselected level and to maintain a difference between the container interior pressure and the pressure of the turbulence causing fluid during the cleaning process.

4,427,456
TOTE BOX CONTENT WASHER AND METHOD OF WASHING

Henry A. Rowan, Watchung, N.J., assignor to Economics Laboratory, Inc., St. Paul, Minn.

Filed Feb. 11, 1982, Ser. No. 348,000
Int. Cl.³ B08B 3/06
U.S. Cl. 134—25.1 21 Claims

1. Apparatus for washing a tote box and the contents of said tote box comprising:

(a) means for supporting said tote box in a tote box load position and a tote box unload position said tote box unload position being relatively higher than said tote box load position;

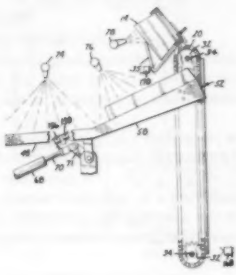
(b) means for transferring said tote box between said tote box load and said tote box unload positions;

(c) a contents washing container having an open top disposed in fixed relationship with respect to said supporting and transferring means and pivotally mounted for movement between first and second positions, said container having a plurality of apertures, said container receiving in said first position the contents from said tote box in said tote box unload position, and said container in said second position emptying said contents into said tote box in said tote box load position, said container pivotally mounted at a height between said tote box load and tote box unload positions and the contents in the first position are relatively higher than the tote box in said tote box load position;

(d) means for rotating said contents container between said first and second positions; and

(e) means for spray cleaning the contents of said tote box after said contents have been received in said container in said first position, wherein when the contents are received in said container when in said first position, said contents are spray cleaned and said apertures provide for drainage.

18. A method of washing a tote box and the contents thereof comprising the steps of:



(a) dumping the contents of said tote box into a contents container having an apertured base and an open top;

(b) spreading the contents over the apertured base to form a thin layer of the contents;

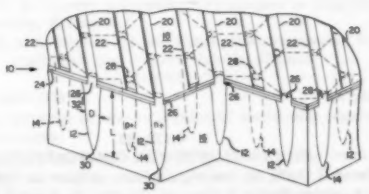
(c) spraying the interior of said tote box and the spread contents through said open top with a cleaning solution; and

(d) emptying the cleaned contents back into said cleaned tote box by sliding the contents from the container into the tote box.

4,427,457
METHOD OF MAKING DEPTHWISE-ORIENTED INTEGRATED CIRCUIT CAPACITORS

F. Paul Carlson; John S. Blakemore, both of Portland, and Nicholas G. Eror, Banks, all of Oreg., assignors to Oregon Graduate Center, Beaverton, Oreg.

Filed Apr. 7, 1981, Ser. No. 251,756
Int. Cl.³ H01L 29/78, 29/80
U.S. Cl. 148—1.5 18 Claims



1. A method of making a capacitor in a solid body of substantially nonconducting material having a reference surface, comprising:

injecting conductive material through said surface depthwise into said body at two separate but closely-spaced positions along said surface to form two narrow conductive regions extending downwardly a distance into said material; and

forming two electrically isolated conductors along said surface including a first conductor connected to a first one of said conductive regions and a second conductor connected to a second one of said regions;

said two regions being electrically isolated within said non-conducting material such that, in operation, electrical charge is stored in the regions and current flow is substantially limited to changes in the amounts of charge stored in said regions.

4,427,458

METHOD FOR FORMING PROTECTIVE SURFACE FILM ON ALUMINUM SHAPED ARTICLES

Akira Hasegawa, Kurobe, and Koichi Tanikawa, Nyuzen, both of Japan, assignors to Yoshida Kogyo K. K., Tokyo, Japan

Filed Nov. 23, 1981, Ser. No. 324,104

Claims priority, application Japan, Dec. 1, 1980, 55-168033; Dec. 1, 1980, 55-168034

Int. Cl.³ C23F *7/14, 7/26*

U.S. Cl. 148—6.15 R **3 Claims**

1. A method for non-electrolytically forming a protective film on the surface of a fastener element of a slide fastener chain made of aluminum or an aluminum based alloy and fastened to a fibrous fabric tape at the periphery thereof which comprises the steps of:

(a) cleaning the surface of the fastener element to effect degreasing thereof,

(b) bringing the fastener element into contact with a treatment solution capable of forming a chemical conversion coating film on the surface of the fastener element;

(c) washing the treatment solution off the fastener element with a spray of wash water;

(d) applying suction to the fabric tape at the reverse side from which said wash water was applied to remove said wash water, and

(e) heat treating the coated article at a temperature of from 90° to 150° C.

4,427,459

PHOSPHATE CONVERSION COATINGS FOR METALS WITH REDUCED COATING WEIGHTS AND CRYSTAL SIZES

Kurt Goltz, Exton, Pa., assignor to Pennwalt Corporation, Philadelphia, Pa.

Filed Jan. 25, 1982, Ser. No. 342,279

Int. Cl.³ C23F *7/10*

U.S. Cl. 148—6.15 R **19 Claims**

1. In an acidic aqueous composition for forming a metal phosphate conversion coating which composition comprises a divalent metal phosphate, wherein the divalent metal is selected from the group consisting of zinc, zinc-nickel, zinc-magnesium, zinc-calcium, zinc-manganese and manganese, an oxidizing accelerator, and a crystal refiner, the improvement wherein the crystal refiner comprises a material selected from the group consisting of chelates of acidic organic phosphates and phosphonates which have at least one free alcoholic hydroxyl group and where the organic phosphate is derived from a cyclic or branched chain organic alcohol.

4,427,460

METHOD OF MAKING MATERIAL FOR SHADOW MASKS

Kenji Araki; Masashi Kurata, both of Yokohama; Hideo Yamana; Toyoharu Suda, both of Kawasaki; Katuhiko Tayama, Yokohama, and Masaji Watanabe, Idanaka, all of Japan, assignors to Nippon Kokan Kabushiki Kaisha and Nippon Mining Co., Ltd., both of Tokyo, Japan

Filed Jan. 27, 1981, Ser. No. 228,914

Claims priority, application Japan, Feb. 4, 1980, 55-11543

Int. Cl.³ C21D *8/04*

U.S. Cl. 148—12 C **7 Claims**

1. A method of making material for shadow masks, comprising forcibly decarburizing a coil of cold rolled low carbon Al-killed steel which before said decarburization consists essentially of

C: less than 0.1%

Si: less than 0.04%

Mn: less than 0.4%

P: less than 0.015%

S: less than 0.015%

Sol.Al: 0.02 to 0.06%

N: 0.0015 to 0.006%

the balance being Fe and unavoidable impurities;

by open coil annealing said steel until it is decarburized sufficiently so that the quench aging index QAI

$$QAI = \frac{W2 - W1}{S}$$

wherein,

W1: load (Kg) giving 10% tensile strain to the said decarburized material having been soaked at a temperature of 500° C. for 10 minutes and subjected to water cooling,

S: cross sectional area (mm^2) of a test piece when giving said 10% tensile strain,

W2: yield point load (Kg) provided by the said strain effected material aged at temperature of 100° C. for 4 hours;

is less than 3.0 Kg/mm^2, and then re-cold rolling said steel, photo-etching, final annealing in a non-decarburizing atmosphere and pressing to form shadow masks.

4,427,461

NITRIDATION AND BRAZING OF ASSEMBLIES WITH TITANIUM-CONTAINING IRON BASED ALLOYS

Lynn E. Kindlimann, Woodland Hills, Calif., assignor to The Garrett Corporation, Los Angeles, Calif.

Filed Nov. 16, 1981, Ser. No. 321,949

Int. Cl.³ C21D *1/48;* B23K *31/02*

U.S. Cl. 148—16.6 **24 Claims**

1. A method for producing a brazed composite of a thin gauge nitride-strengthened titanium-containing iron-base alloy member with a second iron-base alloy member brazed thereto, comprising the sequential steps:

(a) applying to a pre-formed thin gauge titanium containing iron-base alloy member which is pre-assembled to a second iron-based alloy member, a powdered brazing alloy melting in the temperature range of 1700° to 2200° F. and wettable on the surface of said members following nitridation.

(b) heating said assemblage to a temperature in the range of about 1100° to 1400° F. in the presence of an atomic nitrogen-yielding atmosphere in a retort, for a time sufficient to combine substantially all of the free titanium in said titanium-containing iron base alloy member, with nitrogen,

(c) further heating said assemblage in said retort to a temperature in the range of about 1700° to 2200° F. in a non-oxidizing atmosphere which is substatially free of atomic nitrogen, at a heating rate which will denitride metallic nitrides other than titanium nitride before the melting temperature of said brazing alloy is reached, without substantially softening said titanium-nitride strengthened base material, and

(d) holding said assemblage in said 1700° to 2200° F. range until brazing of said titanium strengthened iron-based alloy member to said second member is accomplished.

4,427,462

ELECTRIC APPARATUS AND ITS MAGNETIC CORE OF (100)[011] SILICON-IRON SHEET MADE BY RAPID QUENCHING METHOD

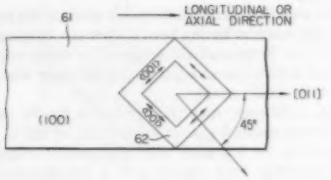
Harufumi Senno, Yamatokoriyama; Masayuki Wakamiya, Suita, and Yukio Horita, Hirakata, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Jun. 18, 1982, Ser. No. 390,132

Claims priority, application Japan, Jun. 18, 1981, 56-95023; Apr. 7, 1982, 57-58883

Int. Cl.³ H01F *1/04*

U.S. Cl. 148—31.55 13 Claims



1. A rapidly quenched silicon steel magnetic core for electric machinery characterized in that high-silicon steels with the {100}<011> crystal texture are used.

4,427,463

METHOD OF AND DEVICE FOR CONTROLLING AND COOLING OF A CONTINUOUS ROLLED MEMBER, E.G. A WIRE

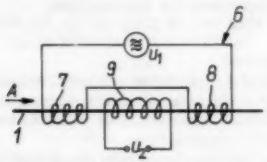
Klaus Spies, Müllheim, Fed. Rep. of Germany, assignor to Fried. Krupp Gesellschaft mit beschränkter Haftung, Essen, Fed. Rep. of Germany

Filed Jun. 18, 1982, Ser. No. 389,976

Claims priority, application Fed. Rep. of Germany, Jun. 27, 1981, 3125315

Int. Cl.³ C21D *1/54, 11/00*

U.S. Cl. 148—129 5 Claims



2. A method of controlling the cooling of a continuously moving rolled steel wire which comprises the steps of:

passing said wire continuously through at least one cooling zone in a cooling stretch in which the wire is contacted with a coolant;

surrounding said wire with a primary coil;

energizing said primary coil with a high-frequency alternating current;

inducing in a secondary coil surrounding said wire and adjacent said primary coil an electric current representing the superficial temperature of said wire resulting from the high frequency energization of said wire by said primary coil, thereby generating a temperature control signal at said secondary coil;

controlling the flow of coolant to said zone in response to said temperature control signal; and

controlling the flow of coolant to said zone in response to said temperature control signal so that the surface of said wire is cooled maximally without martensite formation.

4,427,464

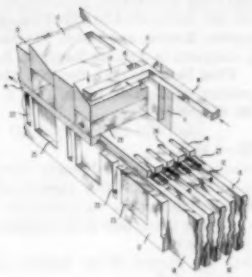
LIQUID PHASE EPITAXY

Bulusu V. Dutt, Parsippany, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Dec. 31, 1981, Ser. No. 336,292

Int. Cl.³ H01L *21/208*

U.S. Cl. 148—171 7 Claims



1. A method for the growth by liquid phase epitaxy of a plurality of crystalline layers, each of a different semiconductor material in succession on a plurality of semconductor wafers comprising

(a) forming a plurality of separate compound semiconductor solutions, each corresponding to a layer to be grown,

(b) placing the wafers in an apparatus together with, but out of contact with, said solutions,

(c) raising the temperature of the apparatus to a first temperature at which said solutions are substantially molten,

(d) separating a first one of said solutions into a plurality of aliquant portions and a remainder portion, said aliquant portions being in contact with said remainder portion,

(e) placing at least a portion of the face of each wafer in contact with one of said aliquant portions of the first solution,

(f) reducing the temperature of the apparatus thereby to grow a first epitaxial layer on said faces of said wafers,

(g) separating a second one of said solutions into a plurality of aliquant portions and a remainder portion, said aliquant portions being in contact with said remainder portion,

(h) removing all of said wafers from contact with any portion of said first solution,

(i) then placing at least a portion of the face of each wafer in contact with one of said aliquant portions of the second solution, and

(j) reducing the temperature of the apparatus thereby to grow a second epitaxial layer on said first epitaxial layer.

4,427,465

EXPLOSIVE MIXTURE FOR BLASTING

Miguel M. Gonzalez, Havana, Cuba, assignor to Empresa Cubana Importadora de Materias Primasy Productos, Vedado, Cuba

Filed Jul. 9, 1981, Ser. No. 281,729

Int. Cl.³ C06B *45/00*

U.S. Cl. 149—2 5 Claims

1. An explosive composition consisting essentially of 0.5–30 percent by weight of a syrup selected from the group consisting of sugar-cane syrup and beet-sugar syrup and 70 to 99.5 percent of ammonium nitrate.

4,427,466

ADVANCED MONOPROPELLANTS

Joseph E. Flanagan, Woodland Hills, and Edgar R. Wilson, Simi Valley, both of Calif., assignors to Rockwell International Corporation, El Segundo, Calif.

Filed Jul. 12, 1982, Ser. No. 397,327
Int. Cl.[3] C06B *25/34*
U.S. Cl. 149—92 9 Claims

1. A liquid monopropellant comprising a 1-nitroxy-3-nitrazaalkane oxidizer, an energetic azido fuel, and a diluent.

4,427,467

LOW VISCOSITY AIR BREATHING MISSILE FUEL

George W. Burdette, Ridgecrest, Calif., and Lewis Hall, Chadds Ford, Pa., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Apr. 29, 1982, Ser. No. 373,080
Int. Cl.[3] D03D *23/00*
U.S. Cl. 149—109.4 2 Claims

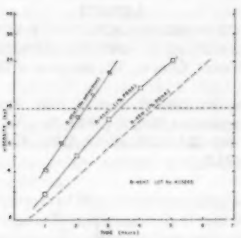
1. A fuel composition comprising:
about 50 to 75% by weight exo-tetrahydrodicyclopentadiene and about 25 to 50% by weight tetrahydromethylcyclopentadiene dimer.

4,427,468

CURABLE PROPELLANT BINDING SYSTEMS WITH BONDING AGENT COMBINATION

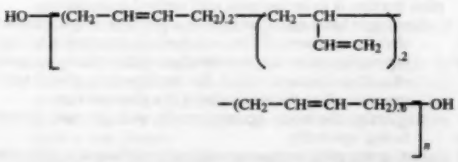
Gonzague L. Duchesne, and Guy Perrault, both of Ste-Foy, Canada, assignors to Her Majesty the Queen in right of Canada, Ottawa, Canada

Continuation-in-part of Ser. No. 803,992, Jun. 6, 1977, abandoned, which is a continuation-in-part of Ser. No. 663,214, Mar. 3, 1976, abandoned. This application Mar. 21, 1978, Ser. No. 888,542
Claims priority, application Canada, Jan. 16, 1976, 243569; Dec. 13, 1977, 292954; Norway, Jan. 4, 1977, 770011
Int. Cl.[3] C06B *45/10*
U.S. Cl. 149—19.9 17 Claims



Effect of Propellant Type on the Pot Life of HTPB Propellants

1. A curable binder system for use in forming a castable composite propellant which comprises:
(i) a hydroxy-terminated butadiene polymer of the formula



wherein n has a value of 57 to 65,
(ii) a diisocyanate curing agent,
(iii) a bonding agent of
(a) an aziridine polyester, wherein the aziridine polyester is the reaction product of tris-(2-methyl aziridinyl-1) phosphine oxide and a diacid selected from the group consisting of a straight chain diacid of the formula

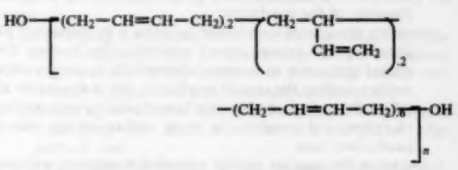
$$HOOC(CH_2)_xCOOH,$$

wherein x is 2 to 8, and a substituted diacid of the formula

$$HOOC\ CH(R)\ (CH_2)_yCH(R_1)COOH$$

in which R and R_1 may be the same or different and are H or OH, and y is 0 to 6, the phosphine oxide being reacted in an amount of one mole per carboxy equivalent of the acid, and
(b) an amine polyester polymer derived from N-methyldiethanolamine and sebacic acid,
wherein the aziridine polyester (a) is present in an amount of 0.1–1% by weight of the total binder, and the amine polyester (b) is present in an amount of 0.1 to 0.5% by weight of total binder, and
(iv) an antioxidant composed of a mixture of about 75–25% by weight of N-phenyl, N'-(1,3-dimethylbutyl)-p-phenylene diamine or N-phenyl, N'-cyclohexyl-p-phenylene diamine and 25–75% by weight of di-tert-butylhydroquinone, the total amount of antioxidant present in an amount of about 1% by weight of the hydroxy-terminated polybutadiene polymer (i).

11. A castable propellant composed of a curable binder system which comprises
(i) a hydroxy-terminated butadiene polymer of the formula



wherein n has a value of 57 to 65,
(ii) a diisocyanate curing agent, and
(iii) a bonding agent system of
(a) an aziridine polyester, wherein the aziridine polyester is the reaction product of tris-(2-methyl aziridinyl-1) phosphine oxide and a diacid selected from the group consisting of a straight chain diacid of the formula $HOOC(CH_2)_xCOOH$, wherein x is 2 to 8, and a substituted diacid of the formula $HOOC\ CH(R)\ (CH_2)_yCH(R_1)COOH$ in which R and R_1 may be the same or different and are H or OH, and y is 0 to 6, the phosphine oxide being reacted in an amount of one mole per carboxy equivalent of the acid, and
(b) an amine polyester polymer derived from N-methyldiethanolamine and sebacic acid,
wherein the aziridine polyester (a) is present in an amount of 0.1–1% by weight of the total binder, and the amine polyester (b) is present in an amount of 0.1 to 0.5% by weight of total binder, and
(iv) an antioxidant composed of a mixture of about 75 to 25% by weight of N-phenyl-N'-(1,3-dimethyl-butyl)-p-phenylene diamine or N-phenyl-N'-cyclohexyl-p-phenylene diamine, and 25 to 75% by weight of di-tert.-butylhydroquinone, said binder having dispersed therethrough finely divided ammonium perchlorate as oxidizer present in an amount of from 68 to 88% by weight of the total propellant and finely divided aluminum present in an amount of from 0 to 20% by weight of the total propellant.

4,427,469

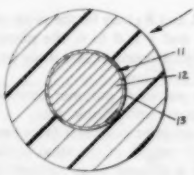
METHODS OF AND APPARATUS FOR CONTROLLING PLASTIC-TO-CONDUCTOR ADHESION OF PLASTIC-INSULATED, TINNED CONDUCTORS

Raymond K. Swartz, Lilburn, Ga., and Horst L. Woellner, Omaha, Nebr., assignors to Western Electric Co., Inc., New York, N.Y.

Continuation of Ser. No. 237,182, Feb. 23, 1981, abandoned. This application Nov. 18, 1982, Ser. No. 442,823

Int. Cl.³ H01B *13/06*

U.S. Cl. 156—50 **3 Claims**



1. A method of making an insulated conductor having a metallic coating between a conductor and an insulative cover wherein the coating has a substantially smooth outer surface and a controlled adhesion to the insulative cover, said method comprising the steps of:

moving an elongated conductor having a circular crosssection along a path of travel, said conductor being made of a first metallic material and being covered with a coating of a second metallic material which has a melting point that is substantially less than that of the first metallic and which has a thickness that is substantially less than the diameter of the conductor;

drawing the coated conductor to reduce its diameter; p1 annealing the drawn coated conductor by heating the coated conductor to increase substantially its temperature and by cooling the coated conductor, the temperature to which the coated conductor is heated causing said coating to reflow and roughen the outer surface of the coated conductor; then

reshaping the coating on the annealed conductor without changing the cross-sectioned area of the conductor by passing the conductor through the opening of a die after it has been heated and after it has been cooled to provide a coated conductor having a substantially smooth outer surface;

covering the coated conductor with a plastic insulation material to form an insulative cover having a thickness which is substantially greater than that of said second metallic material and having an adhesion to said outer surface of said coated conductor which is within a predetermined range of values and which is substantially uniform along the length of the conductor; and

taking up the insulated conductor wherein the step of reshaping the metal coating with said die removes protrusions which would otherwise cause undesirably strong and nonuniform adhesion between said outer surface and said insulative cover.

4,427,470

VACUUM MOLDING TECHNIQUE FOR MANUFACTURING A VENTRICULAR ASSIST DEVICE

Willem J. Kolff, Salt Lake City, Utah, assignor to University of Utah, Salt Lake City, Utah

Filed Sep. 1, 1981, Ser. No. 298,420

Int. Cl.³ A61F *1/24*

U.S. Cl. 156—73.1 **26 Claims**

1. A method of manufacturing an artificial ventricle which comprises a housing and a pumping membrane which divides the interior of said housing into a ventricular blood chamber and a drive fluid pumping chamber, the method comprising the steps of:

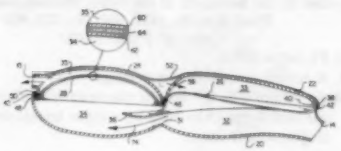
(a) preparing a convex mold having the same shape as the desired artificial ventricle;

(b) vacuum forming a thin layer of thermoplastic polymer over a portion of a first side of said mold;

(c) turning the mold over and vacuum forming a thick layer of thermoplastic polymer over said mold so as to form the ventricular blood chamber portion of the artificial ventricle;

(d) vacuum forming a second thicker layer of thermoplastic so as to form the drive fluid pumping chamber portion of said housing on a second side of said mold;

(e) supporting the portion of said housing vacuum formed in step (d) on a pedestal and vacuum forming a thin layer of



thermoplastic polymer onto said portion of the housing so as to form the drive fluid pumping chamber of said artificial ventricle;

(f) assembling together the thin layers of thermoplastic polymer vacuum formed in steps (b) and (e) so as to form a double layer pumping membrane;

(g) vacuum forming a third, thicker layer of thermoplastic polymer which fits over the assembly of step (f);

(h) bonding the periphery of the thermoplastic layer vacuum formed in step (g) to the periphery of the thermoplastic layer vacuum formed in step (d) so as to enclose the ventricular blood chamber and drive fluid pumping chamber formed in steps (c) and (e) in a housing; and

(i) removing the convex mold used to form the ventricular blood chamber in step (c).

4,427,471

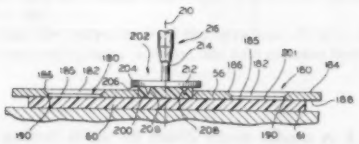
METHOD OF MAKING COMPOSITE SPIN WELDED COUPLER CARRIER ASSEMBLY

Osvaldo F. Chierici, Geneva, Ill., assignor to Holland Co., Geneva, Ill.

Division of Ser. No. 139,439, Apr. 11, 1980, Pat. No. 4,345,689. This application Dec. 23, 1981, Ser. No. 333,817

Int. Cl.³ B23K *19/02*; B29C *37/08*

U.S. Cl. 156—73.5 **5 Claims**



1. The method of securing a planar portion of a metal plate to a polymer body having a flat surface against which the metal plate portion is to be secured, said method comprising:

forming in the metal plate portion a plurality of spaced apart circular apertures of like and similarly oriented side edging configuration that is other than right at the larger ends of said apertures in which the smaller ends of said apertures are all at the same side of the plate portion,

supporting the body against gravity with its said surface facing upwardly,

resting the plate portion on said body surface with said side of the plate portion engaging said body surface,

and as to each plate portion aperture,

taking a disc formed from the same polymeric material as said body and a thickness exceeding by a predetermined amount that of the plate portion, and a diameter equaling the smaller end of the aperture,

resting such disc on the body surface within the smaller end of the respective plate portion apertures,

and while pressing the disc against the body surface, spinning the disc about its axis to through friction heat the disc to fluidize the interface between the disc and the body surface and effect radial outward flow of the disc into direct contact bearing relation with the plate portion aperture edging, and when the disc is subject to drag at the plate portion aperture edging due to said direct contact bearing relation therewith, ceasing spinning of the disc,

and using the body as a heat sink for drawing off heat from the fluidized portions of the disc and body surface for effecting solidification of such fluidized portions for making the disc integral with said body surface and keying said body to said plate planar portion.

4,427,472

APPLIQUE METHOD

Rosemary Trager, 1120 Elm St., Chillicothe, Mo. 64601

Filed Sep. 29, 1982, Ser. No. 427,360

Int. Cl.³ B28B *7/08*

U.S. Cl. 156—93 **3 Claims**

1. A process of applying a plurality of fabric pieces to a background fabric in accordance with a design of a primary pattern for simulating said design on said background fabric using said fabric pieces, said pattern including a plurality of component portions forming said design, said process comprising the steps of:

producing a secondary pattern which bears a mirror image of said design, said secondary pattern including a plurality of neighboring secondary pattern component portions bordered by secondary pattern outlines;

adhering said secondary pattern to the underside of said background fabric;

preparing segments of fabric corresponding to said primary pattern component portions, each of said fabric segments being larger than its corresponding primary pattern component portion so that a fabric piece having essentially the same size as said corresponding primary pattern component portion can be formed therefrom;

using said secondary pattern adhered to said underside of said background fabric to position at least one of said fabric segments on the upperside of said background fabric so that said fabric segment is at least coextensive with a corresponding secondary pattern component portion on the underside of said background fabric;

temporarily securing said fabric segment to said upperside of said background fabric;

sewing said fabric segment to said background fabric by stitching along said secondary pattern outlines which border the corresponding secondary pattern component portion for said fabric segment, said stitching being done with a first thread;

trimming said fabric segment sewn to said upperside of said background fabric to remove excess portions thereof which extend beyond the stitches produced by said sewing with said first thread, thereby producing trimmed fabric pieces; and,

using said stitches produced by sewing with said first thread as guides for sewing further stitches, said further stitches being used to secure said trimmed fabric pieces to said upperside of said background fabric and where appropriate to conceal said stitches made with said first thread.

4,427,473

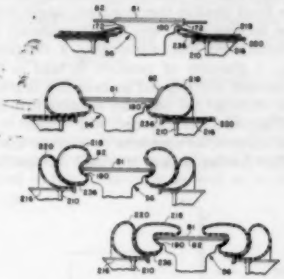
BELT FOLDING MACHINE AND METHOD

Daniel Shichman, Stow, and George E. Enders, Salem, both of Ohio, assignors to NRM Corporation, Akron, Ohio

Continuation of Ser. No. 14,132, Feb. 22, 1979, abandoned. This application Sep. 29, 1982, Ser. No. 428,294

Int. Cl.³ B29H *17/16*

U.S. Cl. 156—130 **60 Claims**



56. A method for folding a tire component comprising the steps of:

(a) arranging the component around a cylindrical deck having a relatively rigid peripheral edge with a cylindrical edge portion of the component extending axially outwardly beyond such peripheral edge of the deck,

(b) locating an annular inflatable bladder partially radially underlying the deck adjacent such peripheral edge thereof, and

(c) expanding the bladder to fold the cylindrical edge portion of the component along a fold line defined by such peripheral edge of the deck, and causing the bladder to move axially inwardly to fold the cylindrical edge portion of the component axially inwardly along such fold line to overlie the adjacent circumferential portion of the component, the bladder when expanding walking up the underside of the deck adjacent such peripheral edge thereof and around such peripheral edge to effect folding of the component edge portion independently of any inextensible element located at the fold and axially outside of such peripheral edge.

4,427,474

METHOD AND APPARATUS FOR MAKING AN AIR CELL CUSHIONING PRODUCT

Gary W. Ottaviano, Bedford Heights, Ohio, assignor to Ranpak Corp., Willoughby, Ohio

Filed Dec. 21, 1981, Ser. No. 333,042

The portion of the term of this patent subsequent to Feb. 9, 1999, has been disclaimed.

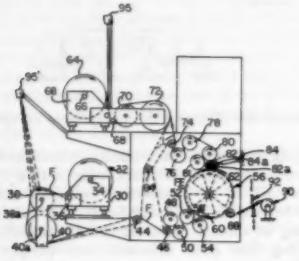
Int. Cl.³ B32B *31/00, 3/28*

U.S. Cl. 156—145 **19 Claims**

1. In a method of manufacturing air cell cushioning dunnage material from a plurality of sheets of flexible thermoplastic, single stratum film, of low melting point, low density material, such as for instance polyethylene film, comprising the steps of, heating a first of the sheets to a temperature sufficient for providing for vacuum forming of the sheet on a forming drum, and embossing said heated first sheet by feeding it onto the

rotating forming drum having a plurality of recesses therein and forming the air cells in the recesses on said forming drum by vacuum, heating a second sheet of the thermoplastic film to about the melting point of the second sheet, cooling the embossed sheet while on said rotating drum by means of said drum to a temperature below said vacuum forming temperature and to a temperature approaching the heat softening point of said thermoplastic material and within a temperature range which is no greater than 30 Fahrenheit degrees above the heat softening point of said material, and then applying said second sheet to said first sheet together with predetermined pressure, whereby the residue heat in said second sheet causes a melting of the confronting surface of the cooled embossed sheet sufficiently in conjunction with said pressure, to cause a heat bonding of said first and second sheets at the areas of engagement while on the drum so as to seal the air cells in the formed product, and then removing the formed product from the forming drum.

15. In an apparatus for producing embossed air cell cushioning dunnage from flexible thermoplastic single stratum sheet stock, of low melting point, low density material, such as for instance polyethylene film, comprising a rotatable forming drum having a plurality of recesses formed in the surface thereof for vacuum forming the air cells in a first sheet of the thermoplastic material fed onto the rotating forming drum, a first series of spaced rollers, spaced, with respect to said forming drum and adapted for engagement with the first sheet, said series of rollers having means provided for heating the first



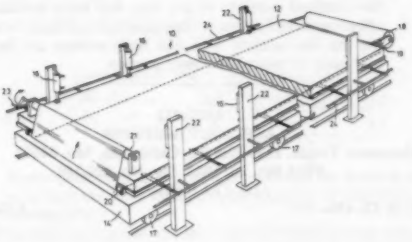
sheet prior to its being fed onto said forming drum to a temperature adequate to provide for vacuum thermoforming of the air cells onto the first sheet on the forming drum, and a second series of rollers, spaced from said first series and having means adapted to heat a second of the thermoplastic sheets of stock materials to a temperature at about the melting point of the second sheet while engaging the second sheet, said forming drum including means for cooling the first sheet while on said forming drum during rotation of the latter, whereby the outwardly facing surface of the first sheet is cooled by said forming drum to a temperature below the vacuum thermoforming temperature of the first sheet and to a temperature approaching the heat softening point of the thermoplastic sheet material, and within a temperature range which is no greater than 30 Fahrenheit degrees above the heat softening point of the first sheet, and means coacting with said second series of rollers for pressurized application onto said rotatable forming drum of the heated second sheet from said second roller series, with the first sheet, whereby the residue heat in the second sheet will cause a melting of the confronting outwardly facing surface of the cooled embossed first sheet sufficiently in conjunction with said pressure, to cause heat bonding of the first and second sheets at the areas of engagement while on said forming drum during rotation thereof so as to seal the air cells in the formed product, the point of application of the second sheet to the cooled embossed first sheet on said forming drum by said application means being a substantial peripheral distance from the point of application of the first sheet to said rotating forming drum so that complete cooling of the first sheet including both side surfaces thereof, can occur on said forming drum prior to said application of the second sheet thereto, and a peripheral distance at least as great as the radius of said forming drum.

4,427,475

MANUFACTURE OF WRINKLE-FREE FLOUROPLASTIC LAMINATED PANELS

Bela Molnar, London, Canada, assignor to Protective Plastics Limited, Scarborough, Canada

Continuation of Ser. No. 278,214, Jun. 29, 1981, abandoned. This application Aug. 30, 1982, Ser. No. 412,811
Claims priority, application Canada, May 11, 1981, 377261
Int. Cl.³ B32B *31/04*
U.S. Cl. 156—163 **6 Claims**



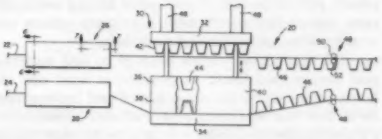
1. In a process for manufacturing a laminated panel wherein a plurality of layers are laminated together under heat and pressure in a press having upper and lower platens, the uppermost layer being a thin film of fluoroplastics material, the improvement in which said film is suspended from the upper platen between longitudinally spaced support means and stretched longitudinally and laterally in a substantially horizontal plane spaced from the lower face of said upper platen, the upper platen is lowered to bring the film into contact with the other layer of material while maintaining the spacing of the film from the lower face of the upper platen, and the press thereupon being closed to press the film into contact with the adjacent layer of the laminate.

4,427,476

METHOD OF UTILIZING RECIPROCATING CLAMP APPARATUS TO THERMOFORM PLASTIC CONTAINERS

Martin H. Beck, Brookline; Suppayan M. Krishnakumar, and Ieuan L. Harry, both of Nashua, all of N.H., assignors to The Continental Group, Inc., Stamford, Conn.

Filed Oct. 28, 1981, Ser. No. 315,842
Int. Cl.³ B32B *1/10*; B29C *17/04*
U.S. Cl. 156—199 **6 Claims**



1. A method of forming containers comprising the steps of providing two sets of mold units with each set including a cavity unit and a plunger unit, each of said cavity units having a cavity of a preselected shape and each of said plunger units carrying a plunger of a shape substantially corresponding to the shape of said cavity, mounting one unit of each mold unit set for movement in unison wherein, when one of said mold unit sets is closed, the other of said mold unit sets is open, providing two continuous webs having at least portions

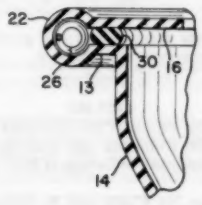
thereof heated to forming temperature, feeding said heated webs between units of respective ones of said mold unit sets, and while forming containers from and integral with one of said webs between closed units of one of said mold unit sets advancing the other of said webs to remove newly formed containers from the other of said mold unit sets and advancing a heated new portion of said other web into alignment with said other mold unit set.

4,427,477

METHOD FOR MAKING A LIPPED VAGINAL CONTRACEPTIVE DIAPHRAGM

Hymen Milgrom, Chicago, Ill., assignor to Milex Products, Incorporated, Chicago, Ill.

Filed Mar. 11, 1983, Ser. No. 474,533
Int. Cl.³ A61F 5/46
U.S. Cl. 156—213 **7 Claims**



1. A method for making a cervical contraceptive diaphragm assembly comprising the steps of:

forming an elastomeric vaginal diaphragm body, said body configured with a central shell-like dome having an outwardly extending flange peripherally attached thereto, said body having a annularly shaped generally planar lip joined at the outer periphery thereof at all points therealong to the outer peripheral edge of said flange to form an annular chamber between said flange and an outer annular portion of said lip, said lip being configured to extend generally planarly inwardly beyond the juncture of said flange and said dome;

providing a toroidally configured spring means and disposing same to lie completely within said annular chamber and proximate to the outer wall thereof, so as to leave an interior annular portion of said flange and an opposing annular portion of said lip facing each other to form an annular joining region along what is to be the inner margin of said annular chamber;

sealing said lip to said flange along the margin of said annular chamber so as to seal the spring means therein.

2. The method of claim 1 wherein said elastomeric diaphragm body is initially partially cured to said setting condition, and said sealing step includes sealing said lip to said flange through a body of curable material added along said margin, and then partially curing the same, and then curing said assembly to a substantially cured condition.

4,427,478

PROCESS FOR MAKING AN ENCAPSULATED CIRCUIT BOARD AND PRODUCTS MADE THEREBY

Barbara D. Grant, and Carol R. Jones, both of San Jose, Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 28, 1982, Ser. No. 392,998
Int. Cl.³ B05D 3/06; B21G 7/02; B65D 85/54; F16B 15/08
U.S. Cl. 156—275.5 **6 Claims**

1. In a process for making an encapsulated circuit board, the improvement which comprises the steps of:

depositing on at least one side of a supporting substrate an adhesive which is photochemically curable;

disposing a plurality of wires in preselected positions in said adhesive; and

exposing the adhesive to light of limited intensity and duration for curing the adhesive to a preselected depth sufficient to maintain the wires registered in X and Y directions on the substrate, while permitting limited pliability of the adhesive and consequent mobility of the wires in the Z direction.

6. A process for making an encapsulated multi-layered circuit board, characterized by the steps of:

depositing on at least one side of a supporting substrate an adhesive which is both photochemically and thermally curable;

disposing a plurality of wires in preselected positions in said adhesive;

exposing the adhesive to light for curing the adhesive beside but not under the wires for maintaining the wires registered in X and Y directions while permitting limited pliability of the adhesive and consequent mobility of the wires in the Z direction;

laminating a plurality of such encapsulated circuit boards together to form a multi-layered structure; and

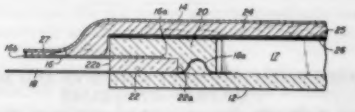
as a part of or subsequent to the laminating step, subjecting the structure to an irradiation dosage sufficient to completely cure the adhesive for rigidly maintaining the wires registered in the Z direction as well as in the X and Y directions.

4,427,479

FLAT-PANEL DISPLAY AND METHOD OF MANUFACTURE

David Glaser, 1918 Raymond Dr., Northbrook, Ill. 60062, and Charles J. Whelchel, 1564 Cove Dr., Prospect Heights, Ill. 60070

Division of Ser. No. 182,782, Aug. 29, 1980, Pat. No. 4,339,482. This application Jan. 4, 1982, Ser. No. 336,547
Int. Cl.³ H01J 9/26, 9/39
U.S. Cl. 156—286 **7 Claims**



1. A method of manufacturing a flat-panel display, comprising the steps of

hermetically sealing an impervious flange to a continuous area of one surface of a panel member, said area surrounding a viewing area of said panel member,

then positioning a display-producing structure against said one face of said panel member over said viewing area,

then positioning an impervious sheet over said display producing structure, and

then sealing said sheet to said flange along a continuous area surrounding said display-producing structure.

2. A method according to claim 1 wherein said flange is malleable, and comprising the further step of

reducing the pressure between said sheet and said panel member below atmospheric.

4,427,480

METHOD AND APPARATUS FOR PROVIDING THE INNER SURFACE OF A PIPE LINE WITH A TUBULAR LINING MATERIAL

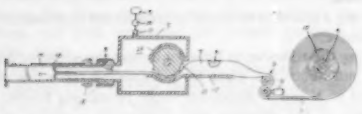
Takashi Kamuro, Kawasaki; Hisao Ohtsuga, Yokohama; Hiroshi Kimura, and Takeshi Nakamura, both of Settsu, all of Japan, assignors to Tokyo Gas Co. Ltd., Tokyo and Ashimori Industry Co., Ltd., Osaka, both of, Japan

Continuation of Ser. No. 294,070, Aug. 18, 1981, abandoned. This application Jun. 20, 1983, Ser. No. 504,857

Claims priority, application Japan, Aug. 19, 1980, 55-114349

Int. Cl.³ B29C *17/07*

U.S. Cl. 156—287 **17 Claims**



2. An apparatus for providing the inner surface of a pipe line with a tubular lining material through a binder under fluid pressure, which comprises (1) a pressure container, provided in the rear end portion with an opening for the introduction of a tubular lining material, in the front end portion with a mouth piece for annularly fixing said tubular lining material thereto and in any suitable position with an inlet for pressurizing fluid, (2) a driving unit for pushing said tubular lining material forward through said pressure container, (3) a sealing device positioned in said rear end opening, which comprises (a) an externally rotatable rotary drum which rotates jointly with said driving unit placed in such a manner that said drum rotates on the path of said tubular lining material, said drum being provided on the outer peripheral surface thereof with a plurality of projections extending transversely parallel to the rotational axis of said drum at definite intervals, (b) a sealing member positioned above said rotary drum and in close contact with said projections to secure air-tightness, and (c) a squeezing base positioned beneath said rotary drum to support said tubular lining material thereon, with the curvature of both of said sealing member and squeezing base being concentric with said rotary drum, in such a manner that said tubular lining material interposed between said rotary drum and said squeezing base may be squeezed in an air-tight manner in at least two adjacent positions at all times at said definite intervals with said projections and a means for rotating said rotary drum jointly with the movement of said driving unit.

4,427,481

MAGNETIZED HOT MELT ADHESIVE AND METHOD OF PREPARING SAME

Ray F. Smith, Blue Springs, and Edward J. Mulik, Kansas City, both of Mo., assignors to R & D Chemical Company, Kansas City, Mo.

Division of Ser. No. 881,173, Feb. 27, 1978. This application Jan. 31, 1979, Ser. No. 7,922

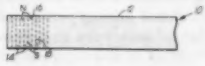
Int. Cl.³ C09J *5/00*; C04B *35/04*

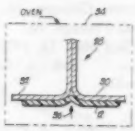
U.S. Cl. 156—306.6 **4 Claims**

1. A method of sealing a joint between two members, at least one of which is metallic, comprising the steps of:

providing a quantity of synthetic resin adhesive having a particulate, permanently magnetized substance dispersed within and throughout the entirety of the synthetic resin, said substance serving to give the adhesive a substantially permanent, net magnetic field; and

placing said adhesive in covering relationship to said joint and in adhering magnetic contact with said one member, and causing at least a portion of said adhesive to be pulled into said joint by virtue of the magnetic attraction between said one member and said particulate substance dispersed throughout said adhesive.





4,427,482

METHOD FOR PRODUCING PREPREG ROVINGS

Fumiyoshi Yamada, Kishiwada, and Shunichi Hiraishi, Sakai, both of Japan, assignors to Dainippon Ink & Chemicals, Inc., Tokyo, Japan

Continuation of Ser. No. 87,455, Oct. 22, 1979, abandoned. This application Feb. 20, 1981, Ser. No. 236,178

Claims priority, application Japan, Oct. 24, 1978, 53-129974; Jul. 9, 1979, 54-85863

Int. Cl.³ C09J *5/02*

U.S. Cl. 156—307.3 **9 Claims**

1. A method for producing a fiber-reinforced plastic article, which comprises disposing prepreg rovings, said prepreg rovings being prepared by impregnating a composition comprising an unsaturated polyester having a hydroxyl value of at least 20, and a hydroxyl value/acid value ratio of at least 1.5, an unsaturated monomer, and a polyisocyanate compound, the amount of said polyisocyanate compound being such that the mole ratio of the hydroxyl groups of the unsaturated polyester to the isocyanate groups of the polyisocyanate compound is from 0.7 to 1.3, into a filamentary reinforcing material and heating the impregnated reinforcing material at a temperature of 60° C. to 110° C. to react the unsaturated polyester with the polyisocyanate compound, between at least two plies of sheet molding compound obtained by impregnating a composition comprising an unsaturated polyester and an unsaturated monomer in glass fibers and forming the impregnated product into a sheet; and consolidating the resulting assembly under heat and pressure.

4,427,483

MICROELECTRODE FABRICTING APPARATUS

Frederick Sachs, Buffalo, and Richard G. McGarrigle, Eggertsville, both of N.Y., assignors to The Research Foundation of State University of New York, Albany, N.Y.

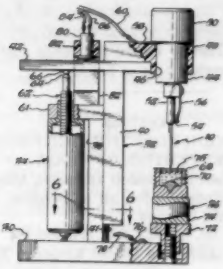
Continuation-in-part of Ser. No. 326,386, Dec. 1, 1981, abandoned. This application Apr. 26, 1982, Ser. No. 371,550

Int. Cl.³ C23F *1/02, 1/00, 3/00*; B44C *1/22*

U.S. Cl. 156—345 **12 Claims**

1. A microelectrode fabricating apparatus for automatic and controlled removal of conductive material from the tip of a microelectrode; comprising

a power driven micromanipulator;
a microelectrode coated with a conductive material and supported by said micromanipulator for movement therewith;
a mercury bath in alignment with the coated tip of said microelectrode;



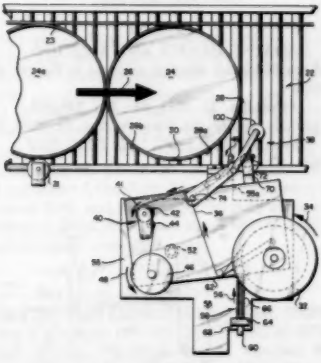
control means for actuating said micromanipulator to move said microelectrode tip into contact with said mercury; and
sensing means responsive to said contact with said mercury for actuating said control means whereby said microelectrode tip penetrates said mercury to a predetermined depth for precise conductive material removal therefrom.

4,427,484

AUTOMATIC LABELING SYSTEM

Allan M. Cameron, Jr., LaGrange, and Charles G. Middleton, Burbank, both of Ill., assignors to Camtron Systems, Inc., Addison, Ill.

Filed Jul. 29, 1982, Ser. No. 402,992
Int. Cl.³ B44C *1/00*
U.S. Cl. 156—361 **27 Claims**



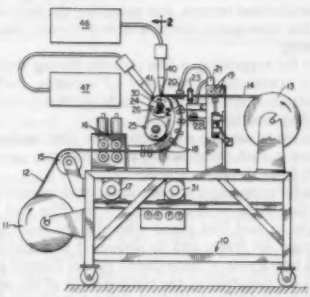
1. An automatic labeling system for applying an elongate label to a preselected curved surface of each of a plurality of objects which move in succession along a given path of travel past a stationary work station, said system comprising: label applying means at said work station for applying said label to each said curved surface; controllable feed means for feeding said elongate labels to said applying means for application to said curved surface at a controllable speed; guide means for positioning said label applying means relative to each said curved surface said guide means comprising, pivotally mounted support means upon which said label applying means is mounted, tracking means carried by said support means and movable therewith for engaging and tracking the curved surface of the objects to which the labels are to be attached, and biasing means urging said pivotally mounted support means and said tracking means toward the path of travel of said objects to maintain said tracking means in engagement with the objects and properly position the label applying means with respect to the curved surfaces of the objects to which labels are to be applied; and control means for controlling the operation and speed of said feed means and correspondingly the application of said label to said curved surface in a predetermined fashion.

4,427,485

ULTRASONICALLY BONDED HELICALLY FABRICATED TUBING AND APPARATUS AND METHOD FOR MAKING SAME

Thomas A. Kutnyak, Greenwood, and Donald L. Johnson, Abbeville, both of S.C., assignors to Automation Industries, Inc., Greenwich, Conn.

Filed May 12, 1982, Ser. No. 377,380
Int. Cl.³ B32B *31/00*
U.S. Cl. 156—429 **4 Claims**



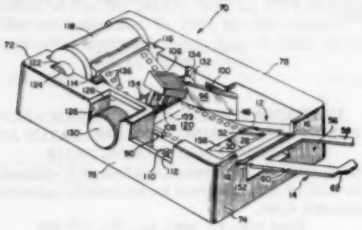
1. Ultrasonic apparatus for continuously forming flexible tubing including at least one wire helix of a certain pitch covered by helically wrapped plastic tape comprising:
(a) a frame,
(b) at least two rotatable mandrels cantilevered from said frame about respective parallel axes arranged equidistant from the centerline of the tubing to be formed thereon,
(c) drive means on said frame for positively rotating at least one of said mandrels about its axis,
(d) wire-receiving circumferential grooves formed about the respective mandrels and spaced apart longitudinally from one mandrel to the next a distance determined by the pitch of the helix to be formed,
(e) tape-feeding means for drawing said tape helically about said mandrels with edge portions of the tape overlapping,
(f) wire-feeding means for applying said wire about said mandrels within said grooves so that the wire helix is formed and covered by said tape,
(g) one of said mandrels having at least one circumferential anvil band located relative to its circumferential groove so as to be beneath the overlapping tape edges drawn over that mandrel,
(h) said anvil band including a plurality of longitudinally spaced rings inset into the mandrel and having an outer annular knurled surface co-planar with the mandrel surface,
(i) at least one ultrasonic horn adjacent to and directed at the rotating anvil band, and
(j) transducer means for activating the ultrasonic horn to fuse the overlapping tape edges together.

4,427,486

APPARATUS FOR MOUNTING TRANSPARENCY FILM

Lawrence E. Green, Burlington, and Richard R. Wareham, Marblehead, both of Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Filed Dec. 24, 1981, Ser. No. 334,088
Int. Cl.³ B32B 31/18
U.S. Cl. 156—517 3 Claims



1. Manually operable, compact apparatus for sequentially cutting sections of a strip of film containing a plurality of visible, individual images, and mounting the same in individual frames for subsequent use in a slide projector, said apparatus comprising:

means for supporting a film cassette having therein a roll of film containing a plurality of sections, each of which contains a visible image, each section including spaced leading and trailing edges;

means for advancing a section of the film, leading edge first, along a first plane while simultaneously unwinding the film from the film cassette;

means for supporting a frame in the path of movement of the leading edge of the section of the film and at an acute angle to said first plane whereby the leading edge may engage the frame and be deflected in a direction toward and into a pair of open-ended guides formed in the frame;

means for maintaining the trailing edge of the section of the film in said first plane during the deflection of the leading edge, thereby stressing the section; and

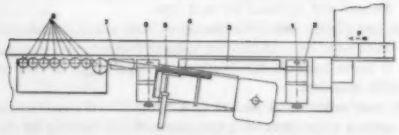
means for severing the trailing edge of the section of the film from the remainder of the strip of film whereby the section of the film returns to an unstressed condition as the severed trailing edge automatically snaps into engagement with the frame.

4,427,487

NOVEL GLUING MACHINE

Giuseppe Manea, Marano Vicentino, Italy, assignor to Off. Mecc. F. lli Manea di Bortolino e Giuseppe Manea & C. s.n.c., Marano Vincentino, Italy

Filed Apr. 22, 1982, Ser. No. 370,942
Claims priority, application Italy, May 26, 1981, 85568 A/81
Int. Cl.³ B32B 31/04
U.S. Cl. 156—546 2 Claims



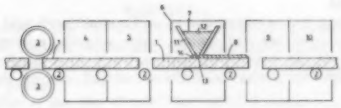
1. An automatic continuous gluing machine for the application of the glue onto the border of a panel being coated and onto the coating strip to be glued to the panel, which comprises means for advancing the panel, means (1) for the introduction of the glue onto the border of the panel advancing along the plane of operaton of the machine, first means for heating and drying the glue (3), a supply of strips (4), said strips being held on a predetermined plane along the machine, a needle roller for removing the strips one by one, a container (6) for the glue to be applied onto the strips, means for spreading the glue onto the interior surface of the strips, second heating means (7) for drying the glue applied on the strips, a plurality of pressure rollers (8), which hold the strip adhering onto the border of the panel being coated for a period of time sufficient to achieve good adherence between the two parts being glued, wherein the first heating means are lamps and the second heating means comprises a jet of hot air.

4,427,488

METHOD OF MODIFYING THE LIGHT-REFLECTING PROPERTIES OF GLASS

Albert Servais, Gerpinnes; Francois Toussaint, Montigny-le-Tilleul, and Hugo Rogghe, Mol, all of Belgium, assignors to Glaverbel, Brussels, Belgium

Filed Jul. 8, 1982, Ser. No. 396,254
Claims priority, application United Kingdom, Jul. 10, 1981, 8121367
Int. Cl.³ B44C 1/22; C03C 15/00, 25/06
U.S. Cl. 156—663 19 Claims



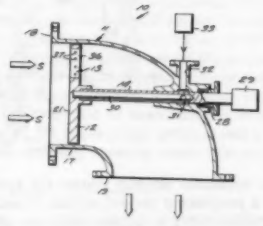
1. A method of modifying the light-reflecting properties of the surface of a glass article by etching the surface with acid, said method comprising: smoothly applying to the surface of the article a uniform liquid film of acid which is sufficiently thin so that quantities of the acid are prevented from flowing across the surface of the article; and subsequently rinsing the article.

4,427,489

MIXING DEVICE AND METHOD

Finn Jacobsen, Karlstad, Sweden, assignor to Kamyr AB, Karlstad, Sweden

Filed Jun. 22, 1981, Ser. No. 276,008
Claims priority, application Sweden, Aug. 19, 1980, 80058233
Int. Cl.³ B01F 5/00, 7/00; D21C 9/10
U.S. Cl. 162—57 16 Claims



1. Apparatus for effecting mixing of a fluid into a suspension, or other fluid comprising:

a conduit having at least a portion thereof that is substantially linear and substantially circular in cross-section;

a substantially smooth-faced circular disc having an area substantially the same as, or slightly less than, the circular cross-section portion of said conduit;

means defining a single through-extending opening in said

disc extending therethrough in said conduit linear dimension, said opening having a small area compared to the area of said disc and being located within a sector of 45° of the disc cross-section;

means for mounting said disc for rotation in said conduit substantially linear, substantially circular in cross-section portion, about an axis of rotation substantialy concentric with said conduit circular cross-section portion; and

means for introducing a fluid directly into said opening from the interior of said disc.

10. A method of mixing a fluid into a suspension, comprising the steps of:

(a) defining a flow path for the suspension past an area of mixing fluid introduction;

(b) moving the suspension along the flow path so that prior to and after the area of mixing fluid introduction it has a velocity below fluidizing velocity;

(c) effecting turbulent fluidization, at any given time, of only a small part of the suspension flowing in the flow path adjacent the area of mixing fluid introduction at the area of mixing fluid introduction;

(d) evenly and uniformly introducing mixing fluid into the fluidized part of the suspension when fluidized; and

(e) progressively treating all parts of the suspension flowing in the flow path so at some time substantially the entire suspension flowing in the flow path will be subjected to turbulent fluidization and fluid introduction.

4,427,490

DELIGNIFICATION AND BLEACHING PROCESS FOR LIGNOCELLULOSIC PULP WITH PEROXIDE IN THE PRESENCE OF METAL ADDITIVES

Robert C. Eckert, King County, Wash., assignor to International Paper Company, New York, N.Y.

Continuation of Ser. No. 139,658, Apr. 14, 1980, abandoned, which is a continuation of Ser. No. 51,171, Jun. 22, 1979, abandoned, which is a continuation of Ser. No. 894,561, Apr. 7, 1978, abandoned. This application Apr. 13, 1981, Ser. No. 253,294

Int. Cl.³ D21C *9/16*

U.S. Cl. 162—78 **8 Claims**

3. A process for delignifying and brightening lignocellulosic pulp comprising admixing lignocellulosic pulp with an aqueous metal solution consisting essentially of about 0.1 to about 5% by weight, based on oven-dried pulp, of a peroxide, about 0.5 to about 20 mole percent, based on moles of the peroxide, of a metal ion selected from the group consisting of tungsten, molybdenum, chromium, osmium and selenium, and sufficient acid to maintain the pH of the resultant pulp slurry between about 1 and about 7, the slurry having a consistency from about 1% to about 50%, and maintaining the pulp slurry at a temperature between about 30° C. and about 100° C. until the peroxide is substantially consumed.

4,427,491

APPARATUS FOR CONTROLLING THE DEPOSITION OF A LIQUID ON TO A MOVING SURFACE

Bronislaw Radvan, Flackwell Heath; Vaughan W. Punton, Beaconsfield, and Paul B. Trendall, High Wycombe, all of England, assignors to The Wiggins Teape Group Limited, England

Continuation of Ser. No. 123,763, Feb. 2, 1980, Pat. No. 4,345,970. This application May 18, 1982, Ser. No. 379,520

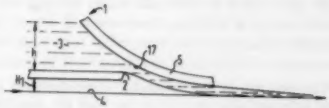
Claims priority, application United Kingdom, Feb. 28, 1979, 7907124

Int. Cl.³ D21F *1/02*

U.S. Cl. 162—299 **7 Claims**

1. Apparatus for controlling the deposition of a liquid on to a moving surface, comprising a reservoir having an outlet, a lower surface of the outlet being adapted to be located above and spaced apart from the moving surface, a guide member downwardly extending from above and adjacent to the outlet and having a convexly curved underside, means for discharging a jet of liquid from the outlet on to the underside of the guide member, the guide member being oriented for allowing the liquid jet to flow unconstrained down the member on the underside and for allowing a lower surface of the jet to be exposed to ambient pressure until the direction of flow of the jet approaches the direction of travel of the moving surface, an end of the guide member remote from the reservoir outlet being adapted to be maintained in a predetermined fixed spaced relationship from the moving surface.

6. A head box assembly for controlling the deposition of a liquid on to a moving wire of a paper making machine, comprising a head box having a slice, a lower surface of the slice being adapted to be located above and spaced apart from the moving wire, a guide member downwardly extending from above and adjacent to the slice and having a convexly curved underside, means for discharging a jet of paper making stock from the slice on to the underside of the guide member, the guide member being oriented for allowing the liquid jet to flow unconstrained down the member on the underside and for allowing a lower surface of the jet to be exposed to ambient



pressure until the direction of flow of the jet approaches the direction of travel of the moving wire, an end of the guide member remote from the slice adapted to be maintained in a predetermined fixed spaced relationship from the moving wire.

7. An apparatus for preparing a multi-layer paper, comprising a wire for carrying a paper web, means for moving said wire, a headbox having an outlet, a lower surface of said outlet being arranged above and spaced apart from the moving wire, a guide member downwardly extending from above and adjacent to the outlet and having a convexly curved underside surface, an end of the guide member remote from the outlet being maintained in a predetermined fixed spaced relationship from the moving wire, means for discharging a jet of liquid from the outlet onto the underside of the guide member, the guide member being oriented such that the jet flows unconstrained down the member on the underside with a lower surface of the jet being exposed to ambient pressure until the direction of flow of the jet approaches the direction of travel of the moving wire to thereby deposit the liquid onto the moving paper web to form a multi-layer paper.

4,427,492

EXTENDED NIP SHOE FOR A NIP IN A PAPERMAKING MACHINE

Dennis C. Cronin, Rockton, Ill., assignor to Beloit Corporation, Beloit, Wis.

Division of Ser. No. 267,397, May 26, 1981. This application Apr. 5, 1982, Ser. No. 365,858

Int. Cl.³ D21F *3/06, 3/08*

U.S. Cl. 162—358 **6 Claims**

1. In a papermaking machine using a compliant transport system to move a web of paper over a hydrodynamic ramp on a hydrostatic shoe, the hydrostatic shoe including:

an open fluid reservoir;

means for pressurizing the fluid in the reservoir to exert a force against an opposing surface to form a nip between the opposing surface and the pressurized fluid; and

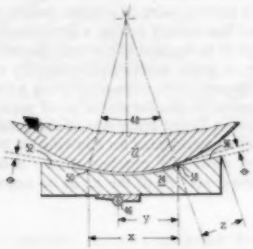
means for advancing the hydrostatic shoe to exert pressure on a compliant transport system passing between the hydrostatic shoe and the opposing surface with which the hydrostatic shoe forms a nip; the improvement comprises:

means for supplying lubricant to the interface of the hydrodynamic ramp and the compliant transport system; and

ramp means for gradually subjecting the compliant transport

system to the pressure exerted by the hydrostatic shoe, the ramp means comprising:

an inrunning nip surface extending approximately 1.5° from a line substantially tangent to a load arc, defined by the hydrostatic shoe against the nip forming surface, through a vertex of a wedge formed when the compliant transport system simultaneously contacts the hydrostatic shoe and the opposing surface with which the hydrostatic shoe forms a nip;



an outrunning nip surface extended approximately 1.5° from a line substantially tangent to the load arc, resulting from the hydrostatic shoe against the nip forming surface, through a vertex of a wedge formed when the compliant transport system ceases to simultaneously contact the hydrostatic shoe and the opposing surface with which the hydrostatic shoe forms a nip; and

means for controllably distributing the release of the pressure exerted by the hydrostatic shoe on side edge portions of the compliant transport system.

4,427,493

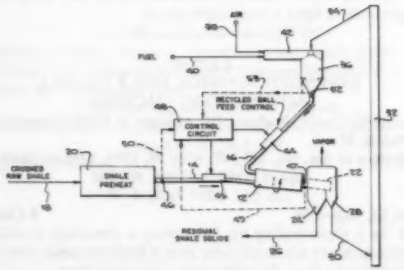
APPARATUS FOR PRACTICING HEAT FLUX CONTROL TECHNIQUE

John H. Barney, Golden, Colo., assignor to Tosco Corporation, Los Angeles, Calif.

Division of Ser. No. 200,395, Oct. 24, 1980, Pat. No. 4,374,017. This application Jun. 16, 1982, Ser. No. 389,061

Int. Cl.³ C10B *1/10, 49/20, 57/00*

U.S. Cl. 202—100 **3 Claims**



1. An apparatus for optimizing the ratio of recycled heat-carrying bodies to carbonaceous material in a system for obtaining combustible products from the carbonaceous material by moving the recycled heat-carrying bodies in heat transferring proximity with the carbonaceous material, wherein the heat-carrying bodies have a critical weight ratio of recycled heat-carrying bodies to carbonaceous material, below which chipping and cracking of such heat-carrying bodies may readily occur, said apparatus comprising:

a retort;

means for supplying carbonaceous material to said retort at a predetermined temperature;

means for supplying recycled heat-carrying bodies to said retort, with the heat-carrying bodies being hotter than the carbonaceous material by a predetermined temperature difference;

means for moving said carbonaceous material and said heat-carrying bodies in heat transferring proximity with one-another in said retort;

means for establishing the weight ratio of heat-carrying bodies to carbonaceous material supplied to said retort;

means for determining the difference in temperature between the heat-carrying bodies nd the carbonaceous material being supplied to the retort; and

means for establishing said weight ratio at a level greater than but substantially equal to said critical ratio for said temperature difference obtained by solving the following equations for R:

$$R=f(U)+K(T-T_o)$$

$$U=F_c/T$$

where R is said weight ratio, f is an experimentally determined function, T is the temperature difference between the heat-carrying bodies and the carbonaceous material, K is an experimentally determined proportionality constant determined by operating the process at different temperature differences with different weight ratios and observing the chip formation in each case; T_o is an arbitrarily selected reference temperature difference; U is the heat transfer coefficient as a function of the weight ratio of recycled heat-carrying bodies to carbonaceous material; and F_c is the critical heat flux below which little or no breakage or chipping occurs.

4,427,494

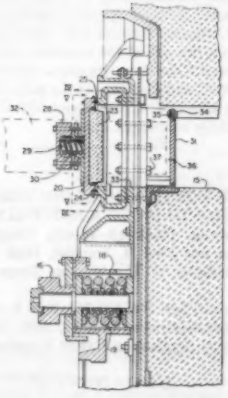
CHUCK DOOR FOR COKE OVEN PUSHER SIDE DOOR AND HEAT RADIATION SHIELD

Roy Naevestad, Fanwood, assignor to Krupp Wilputte Corporation, Murray Hill, N.J.

Division of Ser. No. 234,965, Feb. 17, 1981, Pat. No. 4,372,820. This application Feb. 18, 1982, Ser. No. 350,054

Int. Cl.³ C10B *25/06, 25/16*

U.S. Cl. 202—248 **5 Claims**



1. A chuck door of generally rectangular shape for closing a leveling opening in a main door through which coke is pushed out of the coking chamber of a coke oven battery, said chuck door being of steel, movably mounted so as to engage a seat on said main door, and having knife edge sealing means for engag-

ing said seat on said main door in surrounding relation to said leveling opening, said chuck door having a slot of generally rectangular cross section in the face thereof surrounding the leveling opening in said main door when the chuck door is sealed thereon and a flat knife edge sealing strip tightly fitted in said slot and driven therein by impaction, first screw means engaged in tapped holes in the chuck door and contacting the knife edge strip at intervals along its edge in said slot to adjust the sealing strip to closely conform to the seat on said main door, and second screw means engaged in tapped holes in the chuck door and contacting the sealing strip at intervals along its side to press it laterally against the side of said slot and lock it in an adjusted position.

4,427,495

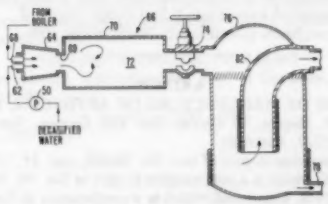
APPARATUS AND METHOD FOR UPGRADING LOW PRESSURE STEAM BRINES AND THE LIKE

Kenneth J. Masero, 600 Arboleda Dr., Los Altos, Calif. 94022

Continuation-in-part of Ser. No. 171,212, Jul. 21, 1980, abandoned, which is a continuation of Ser. No. 955,064, Oct. 26, 1978, abandoned. This application Jul. 2, 1982, Ser. No. 394,561

Int. Cl.³ C02F *1/10, 1/20*

U.S. Cl. 203—11 **6 Claims**



1. A method of converting aerated water containing dissolved salts and suspended solids into pure saturated steam comprising: providing a source of superheated steam; directing a flow of aerated water having dissolved salts and suspended solids therein along a predetermined path; degasifying the water as it flows along said path, said degasifying step including scrubbing the water with a quantity of superheated steam from said source; exerting a back pressure on the water before it is degasified; pressurizing and heating the water after it has been degasified to a pressure at least 70% of the critical pressure but less than the critical pressure and to a temperature of at least 500° F. where the critical pressure is the pressure at which the latent heat of vaporization is substantially zero; moving the water and a quantity of the superheated steam from said source into a mixing zone and into admixing relationship with each other to increase the temperature of the water and cause a major portion of the water to be vaporized and converted to saturated steam while leaving only a residual amount of water containing salts and other solids without substantially condensing the superheated steam; separating the saturated steam from the residual water containing the salts and solids, said source being independent of the residual water separated from the saturated steam; and recirculating at least a part of the saturated steam from said mixing zone to said source of superheated steam.

4,427,496

METHOD FOR IMPROVING THE INSPECTION OF PRINTED CIRCUIT BOARDS

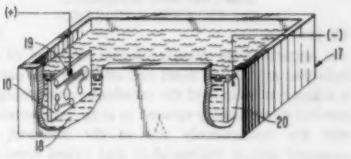
George Katz, Philadelphia, Pa., assignor to RCA Corporation, New York, N.Y.

Filed Jan. 25, 1980, Ser. No. 115,379

Int. Cl.³ G01N *27/26*

U.S. Cl. 204—1 T **7 Claims**

1. A method for improving the optical examination of printed circuit boards to determine the electrical continuity of at least a portion of the circuitry on the printed circuit board comprising the steps of electrically connecting at least a portion of the circuitry of said printed circuit board in a first electrode position of a first polarity, immersing said printed circuit board into an electrolytic bath, immersing a second electrode of the opposite polarity in said bath, passing a direct electric current between said first electrode and said second



electrode through said electrolytic bath in an amount sufficient to cause a change in the state of oxidation of the exposed surface of the circuitry connected in the first electrode position whereby the portion of the circuitry in continuous electrical connection in the first electrode position is electrochemically changed in color so as to be more easily optically distinguished from a portion of the circuit not in electrical continuity.

4,427,497

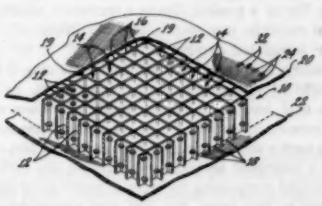
METHOD FOR MAKING UNITARY, HOLLOW STRUCTURES

Theodore A. Heinz, Simi Valley, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Jan. 19, 1981, Ser. No. 226,307

Int. Cl.³ C25D *5/48, 7/08*

U.S. Cl. 204—16 **14 Claims**



1. A method for making an arbitrarily shaped hollw unitary structure, comprising the steps of:

applying an apertured mesh having inner and outer surfaces to a supporting structure to define a cavity;

electroplating a deposit onto said mesh and said supporting structure in a plating solution, such that said deposit is initially formed on both said outer and inner surfaces of said mesh and on said supporting structure within said cavity, thereby bonding said mesh and said supporting structure until said mesh apertures are closed by said deposit, at which point said electroplating substantially ceases within said cavity, but said deposit continues to be formed on said outer surface of said mesh to a desired thickness.

4,427,498

SELECTIVE PLATING INTERIOR SURFACES OF ELECTRICAL TERMINALS

Richard M. Wagner, Harrisburg, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Continuation-in-part of Ser. No. 361,956, Mar. 25, 1982, Pat. No. 4,384,926. This application Jan. 17, 1983, Ser. No. 458,005 The portion of the term of this patent subsequent to May 20, 2000, has been disclaimed.

Int. Cl.³ C25D *5/02, 17/00*

U.S. Cl. 204—26 **12 Claims**

1. An apparatus for plating interior surfaces of electrical terminals that are spaced apart and attached to a carrier strip, that is utilized to strip feed the terminals, comprising:

a mandrel continuously rotated as strip fed electrical terminals are continuously fed to the mandrel, partially wrapped against the mandrel, and exited from the mandrel,

the mandrel being turreted with a plurality of nozzles distributed about the mandrel's axis of rotation,

anode-spreaders mounted within the nozzles, for reciprocation into and out of the interiors of the terminals that are against the mandrel,

a conduit supplying plating solution under pressure through the nozzles and upon the anode-spreader,

the nozzles injecting plating solution into the interiors of the terminals in which the anode-spreaders are received,

a source of electrical potential for supplying electrical current flow from the anode-spreader through the plating solution and into the interiors of the terminals in which the anode-spreaders are received, and

the anode-spreaders being constructed for retraction from the interiors of the terminals.

4,427,499

PROCESS FOR SURFACE TREATMENT OF STAINLESS STEEL SHEET

Tomoge Hitomi, Ageo; Takehisa Konishi, Kawasaki; Tetsutaro Ogushi, and Kazuaki Hatakeyama, both of Tokyo, all of Japan, assignors to Nippon Kinzoku Co., Ltd., Tokyo, Japan

Filed Jul. 29, 1981, Ser. No. 288,183

Claims priority, application Japan, Jun. 4, 1981, 56-85952

Int. Cl.³ C25D *11/36, 11/38*

U.S. Cl. 204—27 **11 Claims**

1. A process for surface treatment of a stainless steel sheet comprising dipping a stainless steel sheet having a bright annealing film or a passive film in a treatment solution and carring out cathodic treatment under conditions of 1 to 600 A-sec/dm^2 integrated current density and 0° to 90° C. solution temperature, said treatment solution containing 0.1 to 50.0% by weight of phosphoric acid, 0.1 to 10.0% by weight of chronic acid, and 0.1 to 2% by weight of sodium silicate.

6. A process for surface treatment of a stainless steel sheet by dipping such a sheet having a bright annealing film or a passive film in a treatment solution and carrying out cathodic treatment thereof comprising the steps of performing said cathodic treatment in two steps, the first step comprising dipping a stainless steel sheet having a bright annealing film or a passive film in a treatment solution containing 0.1 to 50.0% by weight of phosphoric acid, 0.1 to 10.0% by weight of chromic acid, and 0.1 to 2.0% by weight of a member selected from the group consisting of magnesium oxide, sodium silicate and mixtures thereof and carrying out cathodic treatment under the conditions of 1 to 600 A-sec/dm^2 integrated current density and 0° to 90° C. solution temperature, and a second step comprising dipping the stainless steel sheet treated in the first step in a treatment solution containing 0.1 to 70% by weight of phosphoric acid and 0.1 to 10.0% by weight of a molybdate and carrying out cathodic treatment under the conditions of 1 to 600 A-sec/dm^2 integrated current density and 10° to 90° C. solution temperature.

4,427,500

METHOD FOR PRODUCING AN ALUMINUM SUPPORT USEFUL FOR LITHOGRAPHY

Stephan J. Platzer, New Brunswick, N.J., assignor to American Hoechst Corporation, Somerville, N.J.

Filed Mar. 15, 1982, Ser. No. 357,927

Int. Cl.³ G03C *1/60, 1/94;* **B41N** *3/04*

U.S. Cl. 204—33 **9 Claims**

1. A method for producing a substrate for a lithographic printing plate from an aluminum or aluminum alloy sheet which comprises treating at least a portion of the surface of said sheet so as to impart to it a perpendicular center-line roughness value (R) of $\leqq 0.10\mu$ and then graining said portion such that the surface which has been grained comprises pits and:

(i) a distribution of pit diameters such that the arithmetic mean of the pit diameters (Da) is in the range of about $0.5 \leqq Da \leqq 4.0\mu$; and

(ii) at least about 99% of all pits have a diameter $(D99) \leqq 10\mu$; and

(iii) a pit diameter directionality (Dd) $\leqq$ about 10%; and

(iv) a total non-pitted surface area (A) of said plate having either no pits or pits with a diameter of less than or equal to 0.5μ, of less than about 20% of said surface area; and

(v) a center-line average roughness (Ra) of said surface in the range of from about 0.2 to about 1.4μ; and

(vi) a roughness directionality (Rd) $\leqq$ about 10%.

4,427,501

METHOD OF MANUFACTURE OF ARTIFICIAL TEETH

Olbert W. Rogers, 70 Gymea Bay Rd., Gymea, New South Wales 2227, Australia

Continuation-in-part of Ser. No. 28,930, Apr. 11, 1979, abandoned, which is a continuation-in-part of Ser. No. 939,055, Sep. 1, 1978, abandoned, which is a continuation of Ser. No. 722,291, Sep. 10, 1976, Pat. No. 4,125,442. This application Aug. 24, 1981, Ser. No. 295,258

Int. Cl.³ A61C *5/08*

U.S. Cl. 204—37 R **10 Claims**

1. A method for use in constructing a composite metal-porcelain tooth and/or bone reconstruction wherein porcelain is bonded to a basis metal, the method comprising the steps of:

(1) providing a substrate of the basis metal, the basis metal being selected from gold, platinum, palladium, silver and alloys thereof;

(2) depositing on the substrate a coating of a second metal which is different from the substrate and is selected from gold, platinum and palladium;

(3) surface treating said coating by depositing thereon a thin layer of a third metal selected from iron, tin, zinc, copper, cobalt and indium;

(4) effecting a heat treatment so as to bond said third metal to said second metal coating and to provide on an outer surface of said third metal an oxide layer thereof,

(5) providing a layer of a porcelain paste on said oxide layer, and

(6) effecting a further heat treatment so as to fire said porcelain paste to form a porcelain layer and to bond the porcelain layer to said oxide layer, whereby the bonding strength between said porcelain layer and said second metal coating is augmented by the presence of said oxide layer.

4,427,502

PLATINUM AND PLATINUM ALLOY ELECTROPLATING BATHS AND PROCESSES

Joseph A. Abys, Bridgewater, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Nov. 16, 1981, Ser. No. 321,180

Int. Cl.³ C25D *3/52, 3/56*

U.S. Cl. 204—44 **25 Claims**

1. A process for electroplating a metallic substance on a

surface, said metallic substance comprising platinum, comprising the step of passing current through a cathode, an electroplating bath and an anode with cathode potential great enough to electroplate platinum, said electrochemical bath having conductivity greater than 10^{-3} mho-cm and pH greater than 7 characterized in that the electroplating bath comprises an aqueous solution of platinum-aliphatic polyamide complex in which the aliphatic polyamine has from 3 to 20 carbon atoms and substituents are selected from the group consisting of hydrogen, hydroxide, chloride and bromide, the concentration of platinum-aliphatic polyamine complex is between 0.005 molar and saturation and the platinum in the platinum-aliphatic polyamine complex is in a divalent state.

2. The process of claim 1 in which at least 90 mole percent of the metallic substance consists of an alloy, said alloy consisting of at least 10 mole percent platinum, remainder at least one metal selected from the group consisting of silver, copper, nickel, cobalt, gold, ruthenium, rhodium and iridium.

4,427,503

METHOD FOR REDUCING THE ACID CONTENT OF A NITRIC ACID SOLUTION BY USING ELECTROLYSIS CURRENT

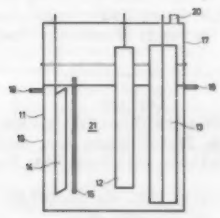
Michael Heilgeist, Linkenheim, Fed. Rep. of Germany, assignor to Kernforschungszentrum Karlsruhe GmbH, Karlsruhe, Fed. Rep. of Germany

Filed Dec. 8, 1981, Ser. No. 328,668

Claims priority, application Fed. Rep. of Germany, Dec. 19, 1980, 3047988

Int. Cl.³ C25B *1/00*

U.S. Cl. 204—101 **3 Claims**



1. Process for reducing the acid content of a nitric acid solution by using an electrolysis current which is capable of reducing HNO_3 at the cathode, comprising

(a) dividing the nitric acid solution into a first volume portion and a second volume portion;

(b) reducing the first volume portion electrolytically to form a reaction product containing ammonium nitrate (AN);

(c) reducing the second volume portion electrolytically to form a reaction product in the form of nitrous gases NO_x, essentially NO and/or NO_2; and

(d) bringing together the reaction products from step (b) and from step (c), and reacting them at a temperature in the range from 50° C. to below the boiling point of the solution resulting from the bringing together of the reaction products by heating the resulting solution.

4,427,504

PROCESS FOR THE CONTINUOUS PRODUCTION OF NITRIC OXIDE (NO)

Samuel Stucki, Baden, Switzerland, assignor to BBC Brown, Boveri & Company, Limited, Baden, Switzerland

Filed Jan. 29, 1982, Ser. No. 344,034

Claims priority, application Austria, Feb. 25, 1981, 872/81

Int. Cl.³ C25B *1/00, 1/12*

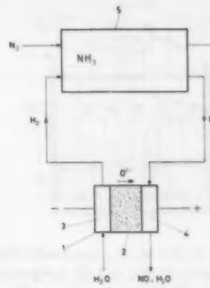
U.S. Cl. 204—101 **8 Claims**

1. A process for the production of nitric oxide from ammonia produced by the Haber-Bosch synthesis, comprising:

(a) vaporizing and heating water to superheated steam;

(b) electrolyzing the superheated steam in a high temperature electrolysis cell to oxygen and hydrogen;

(c) reacting said hydrogen with atmospheric nitrogen



thereby forming ammonia by the Haber-Bosch process; and

(d) oxidizing said ammonia to nitric oxide and water vapor in the anode of said electrolytic cell with the oxygen produced by said electrolysis.

4,427,505

APPARATUS FOR RECOVERING METALS FROM SOLUTION

William J. Stevens, 23/25 Woodstock St., Bondi Juncton, New South Wales, 2022, Australia

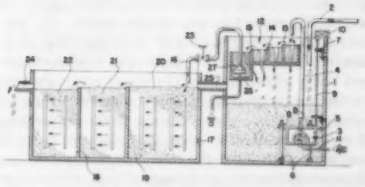
PCT No. PCT/AU81/00008, § 371 Date Jul. 23, 1981, § 102(e) Date Jul. 23, 1981, PCT Pub. No. WO81/02028, PCT Pub. Date Jul. 23, 1981

PCT Filed Jan. 15, 1981, Ser. No. 287,732

Claims priority, application Australia, Jan. 17, 1980, PE2035

Int. Cl.³ C25C *1/20, 7/00*

U.S. Cl. 204—109 **14 Claims**



1. An electrolytic metal recovery unit of the continuous type for recovering metal from a metal rich electrolyte comprising at least three plating-out cells arranged in cascade and having means connecting the cells for supplying spend electrolyte from cells of higher order as the feed material for cells of lower order and means to operate said cells at similar voltages, the cell of highest order having a greater number of electrode sets than any succeeding cell.

4,427,506

AC ETCHING OF ALUMINUM CAPACITOR FOIL

Trung H. Nguyen, Williamstown; John J. Randall, Jr., and Allan B. McPherson, both of North Adams, all of Mass., assignors to Sprague Electric Company, North Adams, Mass.

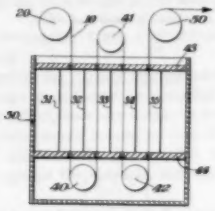
Filed Sep. 24, 1982, Ser. No. 422,931

Int. Cl.³ C25F *3/00, 5/00*

U.S. Cl. 204—129.4 **4 Claims**

1. In a process for the etching of aluminum capacitor foil

comprising passing said foil under the influence of alternating current through hydrochloric acid-based electrolyte containing at least one additive selected from the group consisting of phosphoric, nitric, and tartaric acids, the hydrochloric acid concentration being 0.5 to 1.5 M, the concentration of said



additive being 0.1 to 0.3 M, the frequency of said alternating current being 10 up to 15 Hz, and the temperature being 24° to 37° C., the addition of 200 to 500 ppm sulfate to the etchant permits etching of 3.0 to 5 mil thick foil for the production of foil for higher voltage use than that obtained with the same electrolyte in the absence of sulfate.

4,427,507

PROCESS FOR THE SEPARATION OF GLYCOL FROM AN ELECTROLYTE-CONTAINING AQUEOUS SOLUTION

Andreas B. van Aken; Petrus B. J. van Diepen, and Jeffrey B. Pedley, all of Amsterdam, Netherlands, assignors to Shell Oil Company, Houston, Tex.

Filed Oct. 6, 1982, Ser. No. 433,065

Claims priority, application Netherlands, Mar. 22, 1982, 8201174

Int. Cl.³ B01D *13/02*

U.S. Cl. 204—151 5 Claims

1. In a process for recovering a glycol having two OH groups from an aqueous glycol electrolyte-containing solution comprising introducing said aqueous glycol solution as feed into the depletion compartment of an electrodialytic cell, introducing an electrolyte solution into an anode compartment and a cathode compartment of said electrodialytic cell, said cathode compartment being separated from said depletion compartment by a cation selective membrane, said depletion compartment being separated from the anode compartment by an anion selective membrane, passing a current through said electrodialytic cell at a direct voltage in the range between 0 and 4.5 volt and raising the mole ratio of glycol to electrolyte in said aqueous glycol solution in said depletion compartment, and subsequently removing a substantial part of the water from said aqueous glycol solution, the improvement comprising that in the electrodialysis cell membrane pairs are used the sum of whose electroosmotic fluxes is less than 300 g/F.

4,427,508

LIGHT DRIVEN PHOTOCATALYTIC PROCESS

Norman N. Lichtin, Newton Center, Mass., assignor to Atlantic Richfield Company, Los Angeles, Calif.

Filed May 3, 1982, Ser. No. 374,445

Int. Cl.³ B01J *19/12*

U.S. Cl. 204—157.1 R 20 Claims

1. A method for the light driven photocatalytic reduction of carbon dioxide or the bicarbonate ion to at least one compound which comprises contacting silicon with a hydrogen containing material and at least one of carbon dioxide and the bicarbonate ion in the absence of separate physical electrolyte and electrodes, and conducting said contacting in the presence of light so that the energy of reduction is essentially supplied by said light.

4,427,509

LIGHT DRIVEN PHOTOCATALYTIC PROCESS

Norman N. Lichtin, Newton Center, Mass., assignor to Atlantic Richfield Company, Los Angeles, Calif.

Filed May 3, 1982, Ser. No. 374,446

Int. Cl.³ B01J *19/12*

U.S. Cl. 204—157.1 R 20 Claims

1. A method for the light driven photocatalytic reduction of molecular nitrogen to at least one nitrogen containing compound which comprises contacting silicon with a hydrogen containing material and nitrogen in the absence of separate physical electrolyte and electrodes, and conducting said contacting in the presence of light so that the energy of reduction is essentially supplied by said light.

4,427,510

LIGHT DRIVEN PHOTOCATALYTIC PROCESS

Norman N. Lichtin, Newton Center, and Kalambella M. Vijayakumar, Allston, both of Mass., assignors to Atlantic Richfield Company, Los Angeles, Calif.

Filed May 3, 1982, Ser. No. 374,560

Int. Cl.³ B01J *19/12*

U.S. Cl. 204—157.1 R 13 Claims

1. A method for the light driven photocatalytic reduction of nitrogen to at least one nitrogen-containing compound which comprises contacting one metal compound selected from the group consisting of cobalt oxides, La-Fe-Oxide, La-Ni-Oxide, Pt-La-Ni-Oxide, La-Co-Oxide, lead oxides, chromium oxides, tungsten oxides, molybdenum oxides, praseodynium oxides, neodymium oxides, silica, boiling chips, and a mixture of iron oxides, with nitrogen or a nitrogen-containing gas in the presence of a reducing agent and in the absence of separate physical electrolyte and electrodes, and conducting said contacting in the presence of light having a wave length greater than 420 nanometers so that the energy of reduction is essentially supplied by said light.

4,427,511

PHOTO-INDUCED ELECTRON TRANSFER METHOD

Roland Wohlgemuth, 2823 Hillegass Ave., Berkeley, Calif. 94705, and Melvin Calvin, 2683 Buena Vista Way, Berkeley, Calif. 94708

Filed Aug. 12, 1982, Ser. No. 407,494

Int. Cl.³ B01J *19/12*

U.S. Cl. 204—157.1 R 17 Claims

14. A method for improving photo-energy induced electron transfer comprising associating a photosensitizer metal complex-surfactant and an electron donor metal complex-surfactant with an hydrophobic medium, said hydrophobic medium having an oxidizable organic reactant also associated therewith, contacting the hydrophobic medium with an aqueous medium having an electron acceptor dissolved therein, said hydrophobic medium forming a phase boundary at the aqueous medium interface and wherein the photosensitizer metal complex portion of the photosensitizer metal complex-surfactant and the electron donor metal complex portion of the electron donor metal complex-surfactant lie within the phase boundary and further wherein the hydrophobic medium produces a negatively charged phase boundary, contacting the photosensitizer with photo-energy to thereby activate said photosensitizer, transfering an electron from the activated photosensitizer to the electron acceptor to thereby negatively charge said electron acceptor and repel the charged electron acceptor from the negatively surface charged phase boundary, catalyzing a reaction between the negatively-charged electron acceptor and the aqueous medium to release elemental hydrogen therefrom, transfering electrons from the electron donor metal complex-surfactant to the electron deficient photosensitizer to oxidize the electron donor and reduce the photosensitizer back to its original state, contacting the oxidized electron donor with the aqueous medium to thereby form an oxygen coordinated-electron donor complex, contacting the oxygen coor-

dinated-electron donor complex with the oxidizable organic reactant to oxygenate said organic reactant and reduce said electron donor.

4,427,512

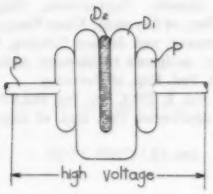
WATER DECOMPOSITION METHOD AND DEVICE USING IONIZATION BY COLLISION

Tay-Hee Han, 202, 6 dong Gangnam Apt, Banpo 2 dong, Gangnam-Gu, Seoul, Rep. of Korea

Continuation of Ser. No. 167,147, Jul. 8, 1980, abandoned. This application Aug. 2, 1982, Ser. No. 404,407

Int. Cl.³ B01K *1/00*

U.S. Cl. 204—164 **6 Claims**



1. A water decomposition method utilizing ionization by collision, said method comprising the steps of:

providing a solid dielectric container formed from a material having a substantially higher dielectric constant than that of water and capable of withstanding voltages greater than about 20 Kv without electrical or physical breakdown, said container having a liquid-receiving space;

positioning a pair of electrodes on opposite sides of the outside of said liquid-receiving space of said container;

filling the liquid-receiving space of said solid dielectric container with water characterized by a covalent bond;

applying a continuous voltage greater than about 20 Kv to said solid dielectric container and across said electrodes to subject said water to a strong electric field strength exceeding the covalent bond strength thereof;

wherein said water is decomposed continually, by ionization by collision, into hydrogen and oxygen for so long as the voltage is applied to said electrodes;

collecting the hydrogen and oxygen gases that are evolved; and

continuously refilling said liquid-receiving space with water to maintain a predetermined quantity of water therein as decomposition occurs.

4,427,513

METHOD FOR COATING A PLANAR SURFACE OF A SEMICONDUCTOR OR INSULATOR WITH A POLYMER FILM

Terje A. Skotheim, 41 Bay Rd., East Patchogue, N.Y., and Kurt I. Lundstrom, Fargaregatan 10, 582 52 linkoping, Sweden

Filed Dec. 31, 1981, Ser. No. 336,448

Claims priority, application Sweden, Jan. 21, 1981, 8100325

Int. Cl.³ C25D *13/08*

U.S. Cl. 204—181 R **9 Claims**

1. A method of selectively coating a surface of a semiconductor or insulator substrate with a polymer film of a given pattern comprising the steps of

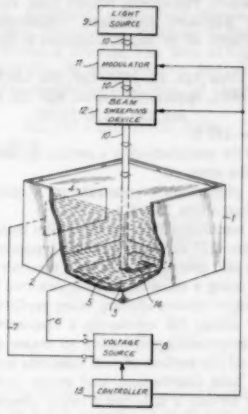
(a) placing a substrate to be coated in an electrolytic cell with said substrate as one electrode

(b) providing a counter electrode in said cell

(c) said cell containing an electrolyte comprising monomers of a polymer forming said film

(d) applying a voltage to the electrodes of said cell

(e) simultaneous with the application of said voltage irradiating a selected portion of said surface, the energy of said irradiation being larger than the band gap between the valance band and the conduction band of said substrate,



whereby said monomer forms a polymer on said surface in said irradiated region.

4,427,514

POLYADDUCT/POLYCONDENSATE WHICH CONTAINS BASIC NITROGEN GROUPS, AND ITS USE

Fritz E. Kempter, Mannheim, and Eberhard Schupp, Schwetzingen, both of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Filed Jun. 15, 1982, Ser. No. 388,514

Claims priority, application Fed. Rep. of Germany, Jun. 19, 1981, 3124089

The portion of the term of this patent subsequent to Jul. 20, 1999, has been disclaimed.

Int. Cl.³ C08G *59/54*

U.S. Cl. 204—181 C **7 Claims**

1. A polyadduct/polycondensate which can be diluted with water when protonated with an acid, contains basic nitrogen groups, and is obtained by the polyaddition reaction of

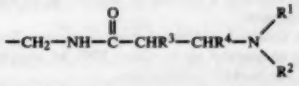
(A) from 5 to 90% by weight of a Mannich base obtained from

(a) a monophenol or polyphenol or a mixture of a monophenol and a polyphenol,

(b) one or more secondary amines (b_1) which contain one or more hydroxyalkyl groups, or a mixture of a secondary amine of this type (b_1) with another secondary amine (b_2), and

(c) formaldehyde or a formaldehyde donor, with

(B) from 10 to 95% by weight of one more epoxy resins, wherein the polyadduct/polycondensate of (A) with (B) contains groups, which are bonded to aromatic rings, of the formula (I)



(I)

where R^1 and R^2 are identical or different and are each alkyl of 1 to 9 carbon atoms, or hydroxyalkyl or alkoxyalkyl, each of 2 to 10 carbon atoms, or are linked to one another to form a 5-membered or 6-membered ring, and R^3 and R^4 are identical or different and each is hydrogen or methyl.

4,427,515
SURFACE ACOUSTIC WAVE DEVICE AND METHOD FOR MANUFACTURING THE SAME

Akitsuna Yuhara, Yokohama; Shinya Iida, Tama; Hideo Abe, Yokosuka; Kiyoharu Kishimoto, Yokohama, and Katashi Hazama, Zushi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Apr. 23, 1981, Ser. No. 256,960
Claims priority, application Japan, Apr. 23, 1980, 55-52965
Int. Cl.³ C23C *15/00*
U.S. Cl. 204—192 E **9 Claims**

1. Method for manufacturing a surface acoustic wave device comprising the steps of:

heating a piezoelectric substrate to a temperature of no lower than about 250° C.;

forming a metal thin film having a film thickness of no less than about 0.25 μm for forming a functional element; and

patterning said metal thin film by a reactive sputter etching process using a resist film to the reactive sputter etching, said reactive sputter etching being performed in the presence of means for averaging a concentration of vapor phase compound contributing to major reactions in the vicinity of the surface of said substrate and correcting an electric field distribution, said means including an SiO_2 member having a hole with larger dimensions than the substrate such that the substrate is positioned in the hole.

4,427,516
APPARATUS AND METHOD FOR PLASMA-ASSISTED ETCHING OF WAFERS

Hyman J. Levinstein, and Frederick Vratny, both of Berkeley Heights, N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Continuation of Ser. No. 295,650, Aug. 24, 1981, abandoned. This application Mar. 4, 1983, Ser. No. 471,901
Int. Cl.³ C23C *15/00*
U.S. Cl. 204—192 E **14 Claims**

1. Apparatus for low-contamination plasma-assisted dry etching of a layer of silicon dioxide formed on a wafer, said apparatus comprising

a reaction chamber,

means for establishing within said chamber an etching plasma derived from a mixture of trifluoromethane and ammonia gases,

said chamber including surfaces exposed to said plasma,

and a coating of silicon on at least the surfaces in the immediate vicinity of said layer to be etched.

4,427,517
UNDERGROUND BACKFILL FOR MAGNESIUM ANODES

Philip Y. Lau, Houston, Tex., assignor to The Dow Chemical Company, Midland, Mich.

Filed Mar. 1, 1982, Ser. No. 353,463
Int. Cl.³ C23F *13/00;* **C04B** *33/13*
U.S. Cl. 204—197 **16 Claims**

1. A backfill composition for use with underground placement of magnesium galvanic anodes, said composition comprising

a mixture of calcium sulfite and bentonite, wherein said bentonite contains a substantial amount of alkaline earth metal bentonite,

and, as an optional additional ingredient, an alkali metal sulfite in an amount up to about 50% by weight of the solids in the backfill composition,

wherein the ratio of calcium sulfite/bentonite is in the range of about 0.2 to about 5.

10. A packaged galvanic anode for underground placement for the cathodic protection of ferrous metal structures, said package comprising

a magnesium anode surrounded by a backfill composition which is contained in a water-permeable material, with means for providing electrical wiring between anode and ferrous metal structure,

wherein said backfill composition comprises a mixture of calcium sulfite and bentonite, wherein said bentonite contains a substantial amount of alkaline earth metal bentonite,

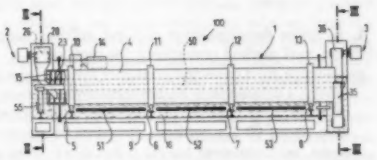
and, as an optional additional ingredient, an alkali metal sulfite in an amount up to about 50% by weight of the solids in the backfill composition, and

wherein the ratio of calcium sulfite/bentonite is in the range of about 0.2 to about 5.

4,427,518
ELECTROPLATING DEVICE

Hans de Vries, Heerde, Netherlands; Siegfried Birkle, Höchstadt, Fed. Rep. of Germany; Klaus Stoeger, Nuremberg, Fed. Rep. of Germany, and Johann Gehring, Spardorf, Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Jun. 1, 1982, Ser. No. 383,979
Claims priority, application Fed. Rep. of Germany, Jul. 10, 1981, 3127390
Int. Cl.³ C25D *17/20*
U.S. Cl. 204—201 **13 Claims**



1. A device for electrolytic processing articles by electrodepositing of aluminum from an oxygen-free and a water-free aluminum-organic electrolyte onto the article, said device comprising an enclosed gas-tight tank for receiving said electrolyte, said tank having means for providing a protective atmosphere in contact with the electrolyte disposed therein and having at least one electrode connected to a pole of a voltage source; a cylindrical drum with a longitudinal axis, an open entrance end and an open exit end; means for mounting said drum in the tank for rotation on said longitudinal axis with said longitudinal axis of the drum being substantially horizontal and a portion of said drum covered with said electrolyte; means for guiding articles to be processed through said drum from the entrance end to the exit end; means disposed in said drum for electrically contacting each of said articles to connect them to the pole of said voltage source; means for introducing articles to be processed into the entrance end of said drum including a first means for conveying articles into the entrance end and first lock means for preventing introduction of undesirable components to the protective atmosphere above the electrolyte, said first lock means including an enclosed housing having an exit opening in communication with the tank and an aperture, said housing having a first partition to separate a portion of the housing in communication with the electrolyte through the exit opening from a second fluid disposed in said housing, a second partition extending from an upper portion of said housing below the level of the fluid in said second portion to isolate the aperature of the housing from the protective atmosphere disposed above said electrolyte, said first means for converging comprising a conveyor belt having an upper end extending over the first partition and a lower end disposed in said second fluid and underneath the second partition for receiving articles introduced into said housing through the aperature; and means for removing processed articles from the exit end of the drum including a second lock means for preventing introduction of undesirable components to the protective atmosphere above the electrolyte, said second lock means having an enclosed housing with an entrance opening commu-

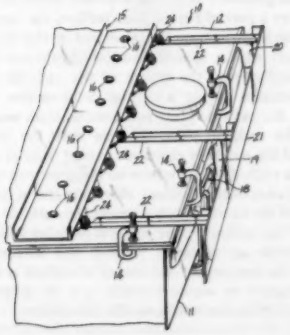
nicating with the tank and a discharge port, said housing have a first partition to separate a portion of the housing in communication with the electrolyte through the entrance opening from a second fluid disposed in said housing, a second partition extending from an upper portion of said housing below the level of fluid in said second portion to isolate the discharge port of said housing from the protective atmosphere disposed above said electrolyte, said means for removing including a second means for conveying the article from the exit of the tank including a conveyor extending into the second fluid beneath the second partition with an upper end being arranged to discharge to the discharge port, said lower end being arranged to receive articles deposited in the second fluid.

4,427,519

MERCURY CATHODE ELECTROLYTIC CELL HAVING PROTECTIVE SHIELD

Charles L. Moore, and Dennis J. Odom, both of Cleveland, Tenn., assignors to Olin Corporation, New Haven, Conn.

Filed Oct. 21, 1981, Ser. No. 313,419
Int. Cl.³ C25B 1/40, 9/00
U.S. Cl. 204—219 5 Claims



1. In a chloralkali electrolytic cell for the electrolysis of an aqueous solution of an electrolyte having an electrolyzer container with a plurality of anodes, a liquid mercury cathode flowing along the bottom of the container and an electrolyzer cover separated from the container by a gasket and secured thereto by a plurality of retaining means, the improvement comprising:

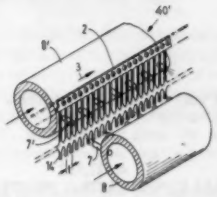
shield means of predetermined thickness connected to the electrolyzer container adjacent at least the retaining means and the entire length of at least one side of the cell such that when an explosive buildup of electrolyte cell gas occurs within the electrolyzer container the flight path of the retaining means and any electrolyte expelled from the container is interrupted by the shield means when the retaining means are forced from their positions and the electrolyte is thrown out of the container from the explosive buildup of hydrogen gas within the electrolyte cell gas.

4,427,520

DEVICE FOR ELECTROPLATING A PORTION OF A MOVING WORKPIECE

Heiner Bahnsen, Augsburg, and Daniël Hosten, Kortemark, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Jan. 29, 1982, Ser. No. 344,060
Claims priority, application Fed. Rep. of Germany, Mar. 5, 1981, 3108358
Int. Cl.³ C25D 17/00, 5/08
U.S. Cl. 204—224 R 17 Claims



1. In a device for electroplating selected portions of a band-like workpiece having a plurality of parts extending from one edge with a spacing t therebetween, said device having at least one anodically connected spray nozzle and means for cathodically connecting the workpiece and for continuously moving the workpiece along a given direction past each nozzle, the improvement comprising each anodically connected spray nozzle comprising a plurality of nozzles of precious metal being positioned in at least one row extending along said given direction with each of said nozzles having an individual stream of electrolyte emerging unimpeded thereform, each row of nozzles being disposed on a surface of a common carrier with the spacing between nozzles of the row being a distance D which is different than the spacing t between parts and different than a multiple of the spacing t, said common container containing means for receiving electrolyte under pressure and distributing it to each of said nozzles to be discharged therefrom as a stream of electrolyte of approximately the same strength, and said means continuously moving the selected portions of the parts of the workpiece along the row of nozzles to be contacted by the streams of electrolyte emerging from the individual nozzles to enable a free and unimpeded electroplating of the portions contacted by said streams.

5. In a device according to claim 1, wherein each of the individual spary nozzles is positioned with its axis forming an angle α with the plane of the workpiece so that the electrolyte flows off of the workpiece in the desired direction.

4,427,521

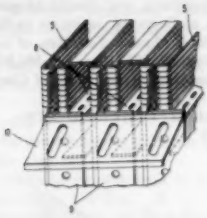
CATHODE ASSEMBLY FOR AN ELECTROLYTIC CELL

Jacques Guillaumont, Saint-Auban, France, assignor to Chloe Chimie, Puteaux, France

Filed Mar. 31, 1982, Ser. No. 363,787
Claims priority, application France, Apr. 10, 1981, 81 07196
Int. Cl.³ C25B 9/04, 13/02, 11/03
U.S. Cl. 204—275 10 Claims

1. An electrolytic cell comprising a vertical housing enclosure of electrically conducting metal, said enclosure confining a peripheral chamber in communicating relationship with a cathode assembly comprising a plurality of lateral internal vertical extensions substantially rectangular in cross-section, said extensions being comprised of perforated metal and extending within the cell, said chamber and the said extensions being strengthened by a plurality of flat metal reinforcing elements substantially rectangular in dimension and arranged

horizontally and extending between said extensions and secured to vertical flat elements disposed within the peripheral



chamber, and said vertical flat elements themselves being fixedly secured to the vertical enclosure comprising the cell.

4,427,522

ELECTRICALLY INSULATING PROTECTIVE DEVICE

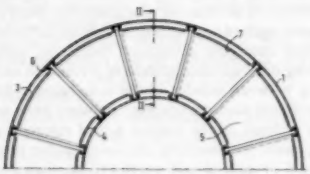
Siegfried Birkle, Höchstadt; Klaus Stöger, Nuremberg; Johann Gehring, Spardorf, all of Fed. Rep. of Germany, and Hans de Vries, NG Heerde, Netherlands, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Mar. 24, 1982, Ser. No. 361,395

Claims priority, application Fed. Rep. of Germany, Mar. 25, 1981, 3111786

Int. Cl.³ C25D *17/02, 17/06, 17/08*

U.S. Cl. 204—279 **10 Claims**



1. An electrically insulating protecting device for use in aluminizing electroplating cells, having an electrolyte tank and which may contain racks for articles which are coupled to a cathode terminal, and anodes located adjacent to the sides of the tank, between which anodes the articles may be disposed, operated with aprotic, oxygen-free and water-free organoaluminum electrolytes, comprising a lining of individual sheet metal segments which are coated with resistant materials and which include:

(a) side baffles disposed behind the anodes at the walls of the electrolyte tank, the outer vertical edges of said side baffles being bent round toward the outside;

(b) connecting straps holding said side baffles together; and

(c) loose bottom segments on the bottom surfaces of the electrolyte tank, said bottom segments lying on top of each other partially overlapping in roof tile fashion.

4,427,523

CATHODE FOR ELECTROLYSIS OF ALKALI METAL CHLORIDE

Yoshio Oda; Takeshi Morimoto, and Kohji Suzuki, all of Yokohama, Japan, assignors to Asahi Glass Company Ltd., Tokyo, Japan

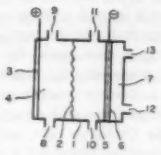
Continuation of Ser. No. 186,847, Sep. 15, 1980, abandoned. This application Aug. 27, 1981, Ser. No. 296,858

Claims priority, application Japan, Sep. 21, 1979, 54-120721

Int. Cl.³ C25B *11/04;* **H01M** *4/62, 4/86*

U.S. Cl. 204—290 R **7 Claims**

1. A porous cathode for electrolysis of an alkali metal chloride comprising a substrate, and a coating comprising a catalyst, a water repellent material and a pore forming agent, said water repellent material being an admixture of a first fluorinated resin having a particle diameter of 0.1 to 20μ and a melting point of 300° to 340° C. and a second fluorinated resin



having a particle diameter of 1 to 50μ and a melting point of 160° to 320° C., and said first resin having a higher melting point than that of said second resin by greater than 5° C.

4,427,524

MAGNETRON CATHODE SPUTTERING SYSTEM

Jacobus E. Crombeen; Jan Visser, and Gary E. Thomas, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed May 6, 1983, Ser. No. 492,107

Claims priority, application Netherlands, May 21, 1982, 8202092

Int. Cl.³ C23C *15/00*

U.S. Cl. 204—298 **5 Claims**

1. A magnetron cathode sputtering system comprising an envelope, a flat cathode plate consisting at least in a surface layer of material to be sputtered, a substantially ring shaped anode which is coaxial with the cathode plate, magnetic means disposed on the side of the cathode plate which is remote from the anode and generates at least one closed tunnel of magnetic field lines over a part of the cathode surface, the tunnel forming at least one electron trap, characterized in, that the electron trap surrounds and is spaced from a rod-shaped electrode extending axially from the centre of the cathode plate, an auxiliary electrode having a tubular cross-section which is coaxial with the cathode plate and extends from near the periphery of the cathode plate, wherein both the rod-shaped electrode and the auxiliary electrode extend from areas on the surface of the cathode plate where no electron trap is present, wherein the bores of the auxiliary electrode and at least of the end portion of the anode which is nearer the cathode plate, the periphery of the cathode plate and the periphery of the rod-shaped electrode are mutually parallel, and wherein during operation of the system the rod-shaped electrode is so spaced from the substrate on which material is to be sputtered that electrons tend to be directed towards the anode.

4,427,525

DUAL GAS MEASURING SOLID ELECTROLYTE ELECTROCHEMICAL CELL APPARATUS

Ching Y. Lin, Monroeville, and Chikara Hirayama, Franklin, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed May 24, 1982, Ser. No. 381,091

The portion of the term of this patent subsequent to Mar. 22, 2000, has been disclaimed.

Int. Cl.³ G01N *27/46*

U.S. Cl. 204—427 **5 Claims**

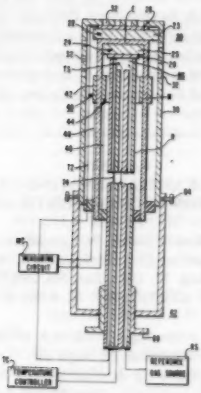
1. A gas analyzer apparatus for measuring gases of a monitored gas environment which contain anhydrides or related compounds in air or in oxygen-bearing gases by generating electrical signals on the basis of a difference in the partial pressure of a gas species between the monitored gas environment and a reference environment, comprising:

an anhydride monitoring solid electrolyte electrochemical cell assembly including first and second identical half

cells, said first half cell including an alkali cation conductive solid electrolyte element and a sensing electrode disposed on a surface thereof, and said second half cell including an alkali cation conductive solid electrolyte element and a reference electrode disposed on a surface thereof,

a solid membrane means of a composition exhibiting oxygen anion conductivity and including an impurity content to support alkali cation conductivity corresponding to the alkali cation conductivity of said half cells, the surface of said first half cell opposite the sensing electrode being in contact with a surface of said solid membrane means at a first location of said solid membrane means, the surface of said second half cell opposite the reference electrode being in contact with an opposite surface of said solid membrane means at said first location;

a sensing and a reference electrode disposed on opposite surfaces of said solid membrane means at a second location of said solid membrane means, the combination of said electrodes and said solid membrane means at said



second location forming an oxygen monitoring solid electrolyte electrochemical cell, said monitored gas environment contacting the sensing electrodes of said first cell and said oxygen monitoring solid electrolyte electrochemical cell;

an anhydride reference means for maintaining an anhydride reference environment in contact with the reference electrode of said second half cell;

an oxygen reference means for maintaining an oxygen reference environment in contact with the reference electrode of said oxygen monitoring solid electrolyte electrochemical cell;

said solid membrane means isolating said monitored gas environment from said reference gas environments

said anhydride monitoring solid electrolyte electrochemical cell assembly developing an electrical signal indicative of both the anhydride content and oxygen content of the monitored gas environment,

said oxygen monitoring solid electrolyte electrochemical cell developing an electrical signal indicative of the oxygen content of the monitored gas environment.

4,427,526
PROCESS FOR THE PRODUCTION OF HYDROGENATED AROMATIC COMPOUNDS AND THEIR USE

Jürgen Stadelhofer, Dortmund; Heinz-Gerhard Franck, Bad Soden-Neuenhain, and Helmut Köhler, Mülheim, all of Fed. Rep. of Germany, assignors to Rütgerswerke Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Nov. 16, 1981, Ser. No. 321,836

Claims priority, application Fed. Rep. of Germany, Dec. 5, 1980, 3045847

Int. Cl.³ C10G *1/00, 45/00*

U.S. Cl. 208—8 LE **8 Claims**

1. In a process for the production of a hydrogenated aromatic compound or mixture of aromatic compounds by thermal treatment of an aromatic oil or mixture of aromatic oils, derived from coal or petroleum, the improvement comprising:

forming an admixture of aromatic oils having a boiling range of 280°–450° C., with residues from the processing of liquid coal conversion products and/or petroleum refining, and

thermally treating said admixture at a temperature in the range of 200° to 380° C. and at a pressure up to a maximum of 15 bar, and up to 10 hours with good inter-mixing of the reaction components, to thereby obtain hydrogenated aromatic compounds

and thereafter separating the hydrogenated aromatic compounds by distillation from the pitch-like residue.

4,427,527
COAL HYDROGENATION IN A LIQUID METALLIC MEDIUM

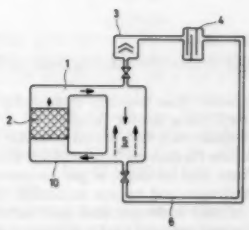
Hans U. Borgstedt, Karlsruhe, Fed. Rep. of Germany, assignor to Kernforschungszentrum Karlsruhe GmbH, Karlsruhe, Fed. Rep. of Germany

Filed Dec. 14, 1981, Ser. No. 330,455

Claims priority, application Fed. Rep. of Germany, Dec. 13, 1980, 3047050

Int. Cl.³ C10G *1/00*

U.S. Cl. 208—8 R **20 Claims**



1. Process for the hydrogenation of coal, comprising contacting coal with a liquid metallic medium to dissolve the coal in the liquid metallic medium and form a substantially saturated solution of carbon (C) in the liquid metallic medium, the liquid metallic medium being conducted through a coal-containing bed and circulated in order to substantially saturate it with carbon, and introducing a hydrogen containing gas into the substantially saturated solution of carbon in the liquid metallic medium at a temperature below 900° K. to convert the dissolved C and H to hydrocarbon compounds within the medium.

4,427,528
PROCESS FOR EXTRACTING CRUDE OIL FROM TAR SANDS

Walter Lindörfer, Christian-Beyer-Strasse 16, 3500 Kassel; Walther Schulz, Mozartstrasse 19, 2848 Vechta; Fritz Wagner, Hohe Wiese 2, 3301 Stöckheim, and Wilhelm Jahn-Held, Schöne Aussicht 8, 3513 Staufenberg 1, all of Fed. Rep. of Germany

Filed Feb. 3, 1981, Ser. No. 231,139

Claims priority, application Fed. Rep. of Germany, Feb. 4, 1980, 3004003

Int. Cl.³ C10G *1/04*

U.S. Cl. 208—11 LE **10 Claims**

1. Process for extracting very viscous crude oil from bitumen-containing originally untreated tar sands comprising the steps of:

(a) admixing a trehalose lipid with water at a temperature from 65° to 90° C.;

(b) adding the mixture from step (a) to the tar sands with intensive agitation to form a slurry; and

(c) separating from the slurry of step (b)/to/a crude-oil/water mixture, containing about ½ of the content of said viscous crude oil from the tar sands.

4,427,529
DISTILLING SHALE OIL FROM OIL SHALE

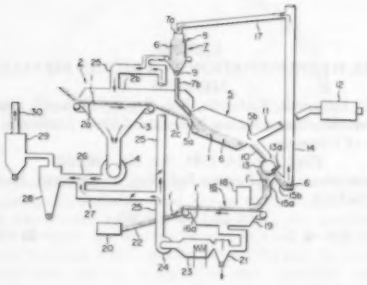
Hiroaki Nishio, Yokohama, Japan, assignor to Nippon Kokan Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 22, 1982, Ser. No. 360,064

Claims priority, application Japan, Mar. 27, 1981, 56-43999

Int. Cl.³ C10G *51/00*; C10B *49/00, 53/00*

U.S. Cl. 208—11 R **14 Claims**



1. An improved method for distilling shale oil from oil shale comprising:

heating a granular heat medium comprising iron oxides including Fe_2O_3 in a heating furnace;

contacting oil shale with said heated granular heat medium in a distillation furnace to heat said oil shale and (i) to vaporize from said oil shale, a gas containing a gaseous shale oil, hydrogen and carbon monoxide, (ii) to reduce, by means of said hydrogen and said carbon monoxide contained in said gas, said Fe_2O_3 contained in said granular heat medium into magnetic Fe_3O_4 and magnetic metallic iron to impart magnetism to said granular heat medium, and (iii) to form a mixture of (a) said granular heat medium which has been cooled through heat exchange with said shale oil, and (b) waste oil shale;

introducing said gas obtained from said distillation furnace into a separator, where said gas is cooled to separate a liquid shale oil from said gas;

magnetically separating said magnetic granular heat medium from said waste oil shale after separation of said gas; and then

feeding back said magnetically separated granular heat medium into said heating furnace to reheat said heat medium and oxidize said magnetic metallic iron and Fe_3O_4 and to recycle said heated heat medium to said distillation furnace;

the improvement comprising:

said granular heat medium additionally containing manganese oxides including Mn_2O_3 in amounts sufficient to provide supplemental heat during said reduction in said distillation furnace with the heat produced through exothermic reactions of said hydrogen and said carbon monoxide contained in said gas with said Mn_2O_3 contained in said granular heat medium.

4,427,530
AROMATIC PITCH DERIVED FROM A MIDDLE FRACTION OF A CAT CRACKER BOTTOM

Ghazi Dickakian, Greenville, S.C., assignor to Exxon Research and Engineering Co., Florham Park, N.J.

Filed Feb. 8, 1982, Ser. No. 346,624

The portion of the term of this patent subsequent to Jun. 2, 1998, has been disclaimed.

Int. Cl.³ C10C *1/00, 1/20, 3/00*

U.S. Cl. 208—22 **23 Claims**

1. A pitch suitable for carbon artifact manufacture, comprising by weight content between 80 and 100 percent toluene insolubles, said pitch having been derived, by heat soaking followed by vacuum stripping, from a deasphaltenated middle fraction of a cat cracker bottom feedstock which is rich in 4, 5 and 6 polycondensed aromatic rings, and wherein said pitch is further characterized as being relatively free of impurities and ash.

4,427,531
PROCESS FOR DEASPHALTENATING CAT CRACKER BOTTOMS AND FOR PRODUCTION OF ANISOTROPIC PITCH

Ghazi Dickakian, Scotch Plains, N.J., assignor to Exxon Research and Engineering Co., Florham Park, N.J.

Filed Aug. 11, 1981, Ser. No. 291,990

Int. Cl.³ C10C *1/20, 1/18, 3/06, 3/08*

U.S. Cl. 208—40 **4 Claims**

1. A process for preparing a feedstock suitable for carbon fiber manufacture comprising the steps of:

(1) vacuum stripping a cat cracker bottom to remove from about 70 weight percent to about 85 weight percent of the polynuclear aromatic oils containing 1, 2 and 3 aromatic rings present in lower boiling fractions of said cat cracker bottom;

(2) extracting the residue of step 1 with a paraffinic solvent to remove a portion of the asphaltenes present in the vacuum stripped cat cracker bottom; and

(3) heat soaking the deasphaltenated cat cracker residue obtained from step 2 to provide a feedstock suitable for carbon fiber manufacture.

4,427,532
COKING OF COAL WITH PETROLEUM RESIDUA

Philip Varghese, Newtown, Pa., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Sep. 28, 1982, Ser. No. 425,364

Int. Cl.³ C10B *55/00*; C10G *69/06*

U.S. Cl. 208—50 **13 Claims**

1. A process for converting coal and liquid hydrocarbon residual materials to liquid products and coke which comprises:

hydrotreating a liquid residual material to produce distillate range material and partially convert heteroatom content to inorganic form;

separating distillate and heteroatom materials from the hydrotreated residual liquid;

comminuting the coal and mixing finely comminuted coal

with the hydrotreated residual liquid in a ratio of about 0.5:1 to 10:1 parts by weight of residue per part of coal;

coking the hydrotreated residual material in the presence of the coal at a temperature of at least 400° C., whereby liquid product heteroatom content and coke yield obtained by coprocessing the coal and residual mixture are substantially lower than that amount produced by coking of the hydrotreated residual liquid alone.

4,427,533
CATALYTIC REFORMING PROCESS

George A. Swan, Baton Rouge, La., assignor to Exxon Research and Engineering Co., Florham Park, N.J.

Continuation-in-part of Ser. No. 82,804, Oct. 9, 1979. This application Apr. 6, 1983, Ser. No. 482,508

Int. Cl.³ C10G *35/06*

U.S. Cl. 208—65 **14 Claims**

1. In a process for improving the octane quality of a naphtha in a reforming unit comprised of a plurality of serially connected reactors, inclusive of a lead reactor, a tail ractor, and one or more reactors intermediate the lead reactor and tail reactor, each of which contains a platinum-rhenium catalyst, the naphtha flowing in sequence from one reactor of the series to another and contacting the catalyst at reforming conditions in the presence of hydrogen,

the improvement comprising

providing the lead reactor of the series with a catalyst having a weight ratio of rhenium:platinum ranging from about 0.1:1 to about 0.5:1, providing the intermediate reactors of the series with a catalyst having a weight ratio of rhenium:platinum ranging above about 0.5:1 to about 1.2:1, and providing in the tail reactor of the series a catalyst having a weight ratio of rhenium:platinum of at least about 1.5:1.

4,427,534
PRODUCTION OF JET AND DIESEL FUELS FROM HIGHLY AROMATIC OILS

Louis W. Bruna, Cabot, and Jaime Lopez, Pittsburgh, both of Pa., assignors to Gulf Research & Development Company, Pittsburgh, Pa.

Filed Jun. 4, 1982, Ser. No. 385,287

Int. Cl.³ C10G *45/50*

U.S. Cl. 208—89 **29 Claims**

1. A process for the production of a jet or diesel fuel from an aromatics-containing feedstock, which comprises contacting hydrogen and a feedstock containing at least 60 volume percent aromatics with a presulfided catalyst composite comprising a Group VIB metal, a Group VIII metal and a halogen impregnated on a cracking support under hydrogenation/hydrocracking conditions in a hydrogenation/hydrocracking reaction zone, said catalyst composite comprising from 18 to about 22 weight percent of said Group VIII metal based upon said total catalyst weight.

4,427,535
SELECTIVE OPERATING CONDITIONS FOR HIGH CONVERSION OF SPECIAL PETROLEUM FEEDSTOCKS

Govanon Nongbri, Newtown; Susan M. Brandt, Oakford, both of Pa., and Michael C. Chervenak, Pennington, N.J., assignors to Hydrocarbon Research, Inc., Lawrenceville, N.J.

Filed Nov. 2, 1981, Ser. No. 317,214

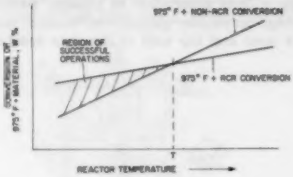
Int. Cl.³ C10G *47/10, 47/26*

U.S. Cl. 208—112 **13 Claims**

1. A process for catalytic hydroconversion of petroleum feedstocks containing at least about 8 W % asphaltenes and having at least about 10 W % Ramsbottom carbon residue (RCR) to produce lower boiling distillate liquids, which comprises:

(a) introducing the feedstock with hydrogen into a reaction zone containing a particulate hydrogenation catalyst;

(b) maintaining said reaction zone at a temperature between about 760° F. to 835° F., hydrogen partial pressure between about 2000 to 3000 psig, and liquid hourly space velocity between about 0.25 to 0.50 $V_f/hr/V_r$ and hydroconverting at least about 65 V % of the feedstock to lower boiling hydrocarbon materials; and


975° F + NON-RCR CONVERSION
REGION OF SUCCESSFUL OPERATIONS
975° F + RCR CONVERSION
CONVERSION OF 975° F + MATERIAL, W %
T
REACTOR TEMPERATURE

(c) withdrawing the hydroconverted material and fractionating it to produce hydrocarbon gas and liquid products.

4,427,536
PROMOTER FOR THE OXIDATION OF SO_2 IN AN FCC PROCESS

Alan W. Klaassen, El Cerrito, and Richard D. Bezman, Richmond, both of Calif., assignors to Chevron Research Company, San Francisco, Calif.

Continuation-in-part of Ser. No. 344,915, Feb. 2, 1982, abandoned, which is a continuation-in-part of Ser. No. 296,619, Aug. 27, 1981, abandoned. This application Aug. 13, 1982, Ser. No. 407,850

Int. Cl.³ B01J *20/02, 23/42, 23/44*

U.S. Cl. 208—113 **10 Claims**

1. An improved fluid catalytic cracking process wherein a circulating inventory including a particulate cracking catalyst is cycled between a hydrocarbon cracking zone and a catalyst regeneration zone and wherein the sulfur content of the gases leaving the regeneration zone is controlled by including in the circulating inventory a sulfur oxide sorbent, the improvement comprising having present in the regeneration zone on an inorganic oxide support a sulfur dioxide oxidation promoter formed by the intimate association of palladium or a compound of palladium with at least one other metal or a compound thereof selected from the group consisting of platinum and iridium, with the proviso that when the other metal is platinum that palladium comprises at least 50% of the associated metals by weight.

4,427,537
METHOD AND MEANS FOR PREPARING AND DISPERSING ATOMED HYDROCARBON WITH FLUID CATALYST PARTICLES IN A REACTOR ZONE

Robert R. Dean, #1 Columbine La., Littleton, Colo. 80123; Jean L. Mauleon, 15656 E. Grand Ave., Aurora, Colo. 80112, and Robert J. Newman, 8586 E. Otero Cir., Englewood, Colo. 80112

Filed Mar. 17, 1982, Ser. No. 359,157

Int. Cl.³ C10G *11/18*

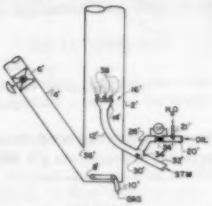
U.S. Cl. 208—120 **7 Claims**

1. A method for catalytically converting portions of crude oil boiling above 600° F. of API gravity in the range of 5 to 28 with fluid catalyst particles which comprises atomizing a crude oil fraction boiling above 600° F. in the presence of gaseous diluent material to form a fog mixture comprising oil droplets in the range of 100 to 500 microns size external to a riser reaction zone

passing the atomized oil-diluent fogged feed mixture through an elongated zone to a feed distributor zone positioned coaxially within the lower portion of an elongated riser reactor zone but above the inlet of catalyst thereto, said distribution zone occupying from 20 to 40 percent of the riser cross section, discharging the atomized-diluent fogged feed mixture through a plurality of

separate upwardly extended restricted passageways from the upper surface of said distributor zone generally inclined outwardly from the axis of the riser reaction zone said fogged feed discharged at a velocity in the range of 300 ft./sec. up to sonic velocity,

passing a fluid suspension of catalyst particles upwardly through an annular passageway between said feed distributor zone and the wall of the riser reaction zone at an



elevated temperature sufficient to convert said discharged atomized oil feed upon contact with the suspended catalyst particles above the distributor zone to form a suspension thereof passing at a velocity sufficient to traverse the riser contact zone within a selected time frame less than 4 seconds and separating the suspension following traverse of the riser reaction zone into a hydrocarbon vaporous product phase and a catalyst phase each separately recovered.

4,427,538

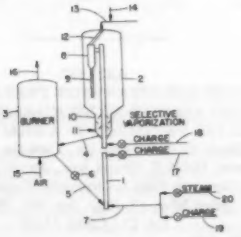
SELECTIVE VAPORIZATION PROCESS AND APPARATUS

David B. Bartholic, Watchung, N.J., assignor to Engelhard Corporation, Edison, N.J.

Continuation-in-part of Ser. No. 155,736, Jun. 2, 1980, Pat. No. 4,328,091, which is a continuation-in-part of Ser. No. 90,247, Nov. 1, 1979, Pat. No. 4,263,128, which is a continuation-in-part of Ser. No. 875,326, Feb. 6, 1978, abandoned. This application Sep. 4, 1981, Ser. No. 299,361

Int. Cl.³ C10G *9/32*; F27B *15/00*; B01J *8/24*

U.S. Cl. 208—127 **11 Claims**



1. In a selective vaporization process for decarbonizing and demetallizing heavy petroleum fractions by contacting such fraction and an inert gas for reduction of the partial pressure of vaporous products of said contacting with a finely divided inert solid contact material at low cracking severity conditions of high temperature and short hydrocarbon residence time in a confined conduit, separating the vaporous products of said contacting from said contact material bearing a combustible deposit of unvaporized high Conradson Carbon or high metal content constituents of said petroleum fraction, cooling said vaporous products to a temperature below that at which substantial thermal cracking occurs, contacting said separated contact material with an oxidizing gas to burn said combustible deposit and heat the contact material to high temperature and returning the so heated contact material to the lower portion of said confined conduit for renewed contact with said heavy petroleum fraction; the improvement providing flexibility in rate of charging said fraction, or in control of said residence time or both which comprises establishing a rising confined column of said solid contact material in said inert gas at the lower portion of said confined conduit, and discharging the contact material as a downwardly flowing stream into an enlarged separation zone for conduct of the aforesaid separation of said vaporous products from said contact material, injecting said heavy petroleum fraction to a point in said confined conduit at or downstream of said lower portion and varying said point of injection to vary said residence time, said heavy petroleum fraction being injected at least in part into said downwardly flowing stream.

4,427,539

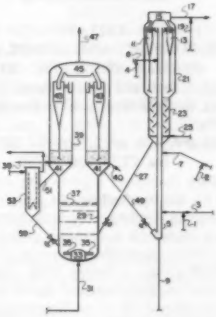
DEMETALLIZING AND DECARBONIZING HEAVY RESIDUAL OIL FEEDS

Lloyd E. Busch, and Gerald O. Henderson, both of Ashland, Ky., assignors to Ashland Oil, Inc., Ashland, Ky.

Filed Sep. 7, 1982, Ser. No. 415,767

Int. Cl.³ C10G *9/32*, *11/18*

U.S. Cl. 208—127 **17 Claims**



1. In a process for visbreaking a residual oil portion of a crude oil with solid sorbent particle material of little or no catalytic cracking activity to produce a demetallized and decarbonized product comprising gas oils suitable for crystalline zeolite catalytic conversion to gasoline boiling range material, the improvement which comprises, contacting the residual oil portion of a crude oil with an initially formed upflowing high temperature suspension of solid sorbent particulate material in a normally gaseous C_4 minus product of the process rich in hydrogen in a time-temperature relationship particularly accomplishing hydrovisbreaking of 566° C. (1050° F.) plus boiling material to produce material boiling below 552° C. (1025° F.) comprising decarbonized and demetallized gas oil boiling range product without substantial restriction on the amount of thermal naphtha produced, restricting the contact time between solids and charged residual oil to less than 2 seconds in the upwardly flowing suspension and; recovering a vaporous gas oil containing product of the visbreaking operation at a temperature in the range of 516° C. (960° F.) to 593° C. (1100° F.) separated from a major portion of the solid sorbent material.

4,427,540

PRODUCTION OF ANODE GRADE PETROLEUM COKE

Harry L. Hsu, Johnson City; Lloyd I. Grindstaff, Elizabethton, and Leslie H. Juel, Johnson City, all of Tenn., assignors to Great Lakes Carbon Corporation, New York, N.Y.

Filed Nov. 8, 1982, Ser. No. 439,912
Int. Cl.³ C10G 9/14; H01B 1/06, 1/04
U.S. Cl. 208—131 10 Claims

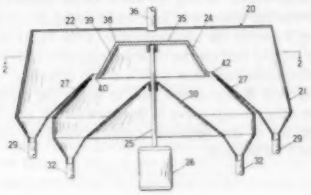
1. A process for producing petroleum coke suitable for use in the manufacture of carbon anodes for aluminum production from a petroleum feedstock containing high levels of vanadium and/or nickel impurities, comprising coking said feedstock in the presence of a magnesium compound selected from the group consisting of inorganic magnesium compounds and oil soluble organo-magnesium compounds in an amount in the range of about 0.001 to 0.1 wt. % calculated as Mg, based on the weight of the feedstock, thereby increasing the oxidation resistance of carbon bodies formed from said coke by inhibiting the catalytic effects of the vanadium and nickel impurities contained in the coke.

4,427,541

METHOD AND APPARATUS FOR SPRAY FRACTIONATION OF PARTICLES IN LIQUID SUSPENSION

Edwin J. Crosby, Madison, Wis., and Anil R. Oroskar, Downers Grove, Ill., assignors to Wisconsin Alumni Research Foundation, Madison, Wis.

Filed Apr. 28, 1982, Ser. No. 372,511
Int. Cl.³ B03B 5/00; D21D 5/22
U.S. Cl. 209—210 28 Claims



26. Apparatus adapted for use in separating particles in liquid suspension by size, comprising:

(a) a disk symmetrical about an axis of symmetry, the disk having a flat face on one side which is smooth and wettable, a sharp, circular edge bounding the face, and a smooth, wettable rim extending away from the face edge and terminating at a rim edge, the length of the rim from face edge to rim edge being at least ¼ inch and the rim interecting the plane of the face at an angle between 90° and 5°; and

(b) means attached to the disk on the side thereof opposite to the face for rotating the disk about its axis of symmetry.

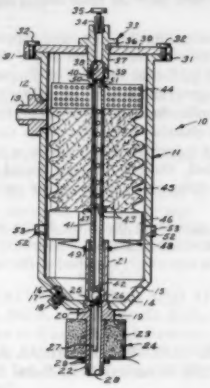
4,427,542

INLINE FUEL FILTER DEVICE

Richard E. Glover, 1092 Terrace Crest, El Cajon, Calif. 92020

Filed Jan. 5, 1983, Ser. No. 440,706
Int. Cl.³ B01D 33/00
U.S. Cl. 210—121 1 Claim

1. An inline fuel filter device, comprising, in combination, an upright, cylindrical housing forming a central chamber, a fuel input opening along a cylindrical side of said housing, a fuel output opening through a bottom wall of said housing, a tubular output fitting screwed in said fuel output opening including an upwardly extending sleeve forming a sump therearound within a lower end of said housing, an outwardly downward end of said output fitting being mounted on an electric solenoid, a floating ball valve inside said output fitting affixed on an armature of said solenoid; a large opening at a top of said housing being closed by removable coverplate, a manually openable purge valve mounted through said coverplate for communication with said chamber, including a hollowed seat at its lower end, and a floatable filter unit supported between said seat and said ball valve; said floatable filter unit comprising a filter float mounted upon a bellows-shaped filter, a fuel pan affixed to a bottom of said filter and a tubular fuel valve rod



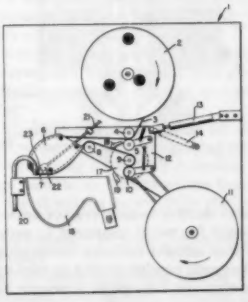
extending through said filter float, filter and fuel pan, an upper end of said fuel valve rod being seated in said seat while a lower end thereof extends inside said sleeve for selective abutment with said floating ball valve, said tubular rod including transverse means for fuel from said filter to enter into said rod, and a bellows seal being between said filter and said sleeve.

4,427,543

AUTOMATIC TAPE FILTER

Charles E. Frick, South Charleston; Archie F. Skidmore, Hurricane, and Isaac E. Williams, Charleston, all of W. Va., assignors to Union Carbide Corporation, Danbury, Conn.

Filed Dec. 20, 1982, Ser. No. 451,179
Int. Cl.³ B01D 29/02
U.S. Cl. 210—143 8 Claims



1. A tape filter device for the removal of solids from liquid media comprising:

(a) a tape head support member having a guide surface, shaped and of a size such that an elongated band of filter media is tension fitted and in contact with the guide surface before it is immersed within the liquid media and covers filtrate passage(s) therein, which openly connect to an outlet;

(b) means for supplying a continuous tape of filter media to the tape head support member;

(c) means for advancing filter media about the tape head

support member such that the filter media covers the filtrate passage(s) within the guide surface, while providing that the filtrate passing through the guide surface must pass through the filter medium;

(d) a weir having an outlet passage, curved to prevent it filling with solids, such that liquid media is channeled through the weir past the filter media and into the outlet passage;

(e) means for actuating the tape head support member such that said member travels in and out of the weir;

(f) the outlet of (a) for the removal of filtered liquid from the filtrate passage(s) and means for maintaining the pressure inside the collecting chamber lower than the pressure outside said chamber such that when the tape head support member is immersed in the weir, a pressure differential is created, thereby forcing liquid media to flow through the filter media and into the collecting chamber; and

(g) means for collecting the filter media once it has filled with solids in synchronization with means (b) so that clean filter media is repeatedly supplied to the tape head support member.

4,427,544

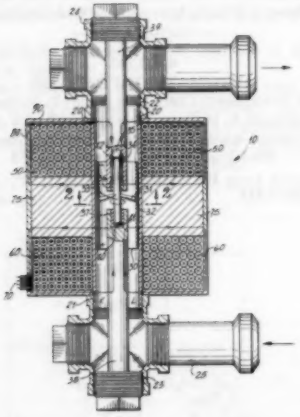
MAGNETO ELECTROCHEMICAL REACTOR

Ricardo Roch, 2138 Biscayne Blvd., Suite 204, Miami, Fla. 33137

Continuation-in-part of Ser. No. 139,180, Apr. 11, 1980, abandoned. This application Aug. 12, 1981, Ser. No. 292,056

Int. Cl.³ C02F *1/48*

U.S. Cl. 210—222 **2 Claims**



1. A magneto electrochemical reactor device to be used as a fluid conditioner for water treatment to prevent scaling and corrosion of heat transfer surfaces, comprising:

(a) a non-magnetic conduit having an inlet and an outlet, and

(b) a hydromagnetic homopolar generator having a cylindrical iron armature secured to a centrally disposed shaft through a plurality of spider legs adapted to rotate as the fluid flows through said conduit further including a pair of ferrous rods with terminations at the inlet and outlet of the conduit holding said shaft in place through insulated bushing means and means for creating a magnetic field perpendicular to said armature including a ferromagnetic yoke separated from said rods thereby forming a gap through which the resultant magnetic field is directed and concentrated so that sufficient electric current is induced in said armature to electrolytically produce ferrous ferric oxides capable of providing a protective film on said heat transfer surfaces.

4,427,545

DUAL FUEL FILTER SYSTEM

Arcadio C. Arguilez, 1302 Carol Pl., National City, Calif. 92050

Filed Dec. 13, 1982, Ser. No. 449,295

Int. Cl.³ B01D *23/24, 29/38, 35/02*

U.S. Cl. 210—333.1 **1 Claim**

1. A fuel filter comprising:

(a) a main fuel supply line having a pump therein;

(b) a junction in said main supply line downstream of said pump branching off into a first and second filter supply line;

(c) a valve at said junction capable of directing fuel alternatively to said first or second fuel supply line;

(d) a first and second filter zone fueled by said first and second fuel supply lines, respectively;

(e) a sealed filter container housing said first and second filter zones and defining with said filter zones a common filtered fuel area downstream of both of said filter zones;

(f) a filtered fuel takeoff system downstream of said filter zones communicating with said common filtered fuel area; and

(g) a dump valve in each of said first and second fuel lines, each dump valve having an open mode permitting free fuel flow in the respective line, and a dump mode in which the supply line on the upstream side of the valve is shut off and the supply line on the downstream side of the respective valve communicates with a dump opening, whereby either of said dump valves can be set in the dump mode with the other dump valve in the open mode, and the filter downstream of the respective dump valve in the dump mode will be flushed.

4,427,546

FILTRATION DEVICES

Pierre Choquenet, Chauny, and Jean C. Carle, Viry Noureil, both of France, assignors to Societe L. Choquenet (S.A.), Chauny, France

Filed Jun. 7, 1982, Ser. No. 386,120

Claims priority, application France, Jun. 4, 1981, 81 11036

Int. Cl.³ B01D *33/04, 33/38*

U.S. Cl. 210—351 **7 Claims**

1. A filtration device comprising, in combination, a rotary drum, a first continuous filter cloth enflanking a first angular sector of the drum and separable from the drum in a second angular sector, a second continuous filter cloth enflanking said first sector and separable from the drum in said second angular sector, a series of cellular elements enflanking the first sector and comprising a cell whose interior has grooves in communication with a discharge orifice for filtered liquid from said first cloth, lateral injection means for injecting a charged liquid to be filtered and comprising, for each cellular element, at least one lateral injection tube connected to a source of charged liquid, means for moving said injection means between an injection position in which its free extremity extends between the two cloths into the filter chamber delimited between the drum and the corresponding cellular element, and an idle position in which the injection means extends at the outside of the chamber and is disengaged from the two filter cloths, control means for moving each injection means to said idle position when it reaches the said second angular sector and for returning the same to its injection position when it leaves said second sector, said drum having an outer surface comprising, in alignment with each of said cells, a series of grooves in communication with an orifice for recovery of filtered liquid

from said second cloth, and control means for moving said cellular elements toward and away from said drum.

4,427,547

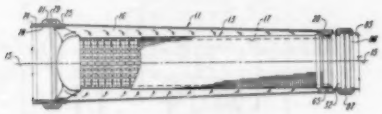
BACKWASHING-TYPE FILTERING APPARATUS WITH FILTER SUPPORT GRID OF RING-LIKE SEGMENTS

Wendell R. Miller, Denver, and Alphonso L. Martinez, Littleton, both of Colo., assignors to Quantum Systems Corporation, Denver, Colo.

Division of Ser. No. 342,484, Jan. 25, 1982. This application May 6, 1982, Ser. No. 375,554

Int. Cl.³ B01D *25/02, 27/12*

U.S. Cl. 210—411 **5 Claims**



1. In a filtering apparatus for removing solid particles and the like from a liquid adapted to be cleaned by backwashing, the combination comprising:

an outer housing and an inner filter disposed within the outer housing defining therebetween an annular outer flow passage,

said filter having an inner flow passage whereby a forward flow liquid with solid particles is passed through an inlet into said outer flow passage, the solid particles being deposited on said filter and the liquid passing through the filter into and along and out an outlet in said inner flow passage in the forward flow direction, and whereby a backwash liquid is passed into said inner flow passage, through said filter, and into said outer flow passage to remove solid particles collected on said filter in a backflow direction,

said filter including an inner support grid having a plurality of liquid flow openings extending between the outer and inner faces to pass a liquid therethrough and a filter medium mounted on said support grid between said inner and outer flow passages,

said support grid being made up of a plurality of ring-like segments, each segment having a centrally disposed ring portion that is continuous for a full arc of 360 degress, and a plurality of circumferentially spaced pairs of axial portions projecting axially out from opposite sides of the ring portion and having flat ends that abut an adjacent axial portion of an adjacent ring for forming said liquid flow openings,

said outer housing having an internal dimension related to the external dimension of said inner filter so that said outer flow passage changes in dimension along the filter in such a way as to provide substantially a uniform liquid velocity through said filter at all points along said filter in both said forward flow direction and said backflow direction.

4,427,548

FILTERING METHOD AND APPARATUS

Joe A. Quick, Jr., Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Filed Jan. 6, 1982, Ser. No. 337,359

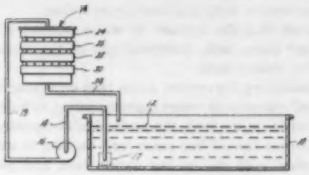
Int. Cl.³ C02F *3/04*

U.S. Cl. 210—617 **5 Claims**

1. An improved method of detoxifying aquarium water which comprises:

a. removing water from the aquarium;

b. flowing this removed water downwardly through a plurality of alternating layers of air and porous, open-cell polymeric foam layers located one beneath the other with sufficient spacing between the foam layers to allow free circulation of air in and out of the air layers, each of said foam layers having an aerobic nitrifying bacterial community living in it and the flow rate of the downwardly flowing water being maintained sufficiently slow enough



so as not to submerge the porous foam layers as it trickles through them;

c. collecting the water at the bottom of the foam layers after it has passed through them; and

d. returning the collected water to the aquarium.

4,427,549

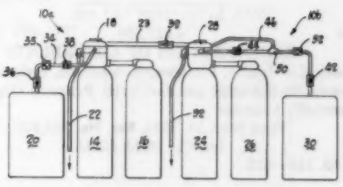
DEIONIZATION METHOD AND APPARATUS

Keith E. Brown, Solon, and Jimmy D. Buth, Chardon, both of Ohio, assignors to Kinetico, Inc., Newbury, Ohio

Filed Aug. 19, 1982, Ser. No. 409,586

Int. Cl.³ B01J *47/14, 49/00*

U.S. Cl. 210—662 **15 Claims**



14. A method for deionizing water, comprising the steps of:

(a) providing a pair of cation tanks, each containing cation exchange material, and a pair of redundant anion tanks, each containing anion exchange material.

(b) placing one of said cation and anion tanks on-line in serial fluid communication, while maintaining said other cation and anion tanks off-line;

(c) introducing water to be deionized into said on-line cation tank and conveying said water along a flow path extending through said cation exchange material to remove cations from said water;

(d) transferring the decationized water from the on-line cation tank to the on-line anion tank and conveying the transferred decationized water along a flow path extending through the anion exchange material to remove anions from said water;

(e) discharging the deionized water from the on-line anion tank;

(f) monitoring the quantity of water conveyed through the on-line cation tank;

(g) regenerating the cation tank upon sensing a quantity of water corresponding to a depleted condition of the cation tank discharged by said one cation tank, the method of regeneration comprising the steps of:

(i) placing the off-line cation tank on-line in a serial communication with the on-line anion tank and placing the depleted cation tank off-line;

(ii) conveying a cation regeneration fluid through said flow path in the depleted off-line cation tank in a counterflow direction for a predetermined time and discharging the regeneration fluid from said cation tank into a drain means;

(iii) rinsing said off-line cation tank by conveying decationized water from the on-line cation tank along the cation

flow path in the off-line cation tank in a counterflow direction and discharging the rinse water to said drain means;

(iv) maintaining the regenerated tank off-line until the on-line cation tank requires regeneration;

(h) monitoring the amount of water conveyed through said on-line anion tank, independently of the monitoring of the on-line cation tank;

(i) regenerating the on-line anion tank upon sensing a predetermined quantity of water corresponding to a depleted condition of the anion tank, the method of comprising the steps of:

(i) placing the off-line anion tank on-line, in serial communication with the on-line cation tank and placing the depleted anion tank off-line;

(ii) conveying an anion regeneration fluid through said flow path in the depleted off-line anion tank in a counterflow direction for a predetermined time and discharging the anion regeneration fluid from said anion tank into the drain means;

(iii) flushing residual anion regeneration fluid from a regeneration fluid supply conduit with deionized water from the on-line anion tank;

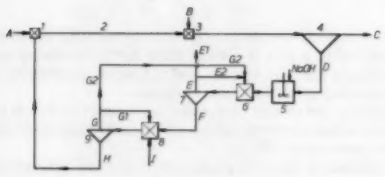
(iv) rinsing said off-line anion tank by conveying deionized water from the on-line anion tank along the anion flow path in the off-line anion tank in a counterflow direction and discharging the rinse water into the drain means;

(v) maintaining the regenerated anion tank off-line until the on-line tank requires regeneration.

4,427,550
REGENERATION OF ADSORBENTS

Anthony J. Priestley, Elsternwick, Australia, assignor to Commonwealth Scientific and Industrial Research Organization, Campbell, Australia

Filed Mar. 31, 1982, Ser. No. 363,930
Int. Cl.³ B01J *20/34*
U.S. Cl. 210—675 **15 Claims**



1. A process for the regeneration and recovery of a loaded adsorbent which comprises the steps of:

(a) contacting the loaded adsorbent with an alkaline solution for a period sufficient to effect regeneration of the adsorbent;

(b) diluting the resulting slurry of the adsorbent in the alkaline solution with recycled overflow liquid from one or both of the subsequent separation steps, to thereby reduce the concentration of adsorbent in the slurry to at least the level where unhindered settling can occur;

(c) separating the slurry to give a first liquid overflow and a first solids underflow containing the adsorbent and discharging at least a portion of the first liquid overflow to waste, the remainder being returned to step (b);

(d) slurrying the first solids underflow from step (c) with washwater and recycled second liquid overflow from the subsequent separation step;

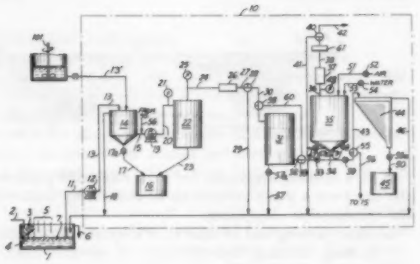
(e) separating the thus formed slurry to give a second liquid overflow and a second solids underflow containing the adsorbent and returning a portion of the second liquid overflow to step (d) and the balance to step (b);

(f) recovering the second solids underflow containing the regenerated and washed adsorbent.

4,427,551
SOLIDS SEPARATION AND LIQUID CLARIFICATION SYSTEM

Jean Duveau, 12 rue des Montatons, 91240 Saint Michel sur Orge, France

Filed Sep. 18, 1981, Ser. No. 303,550
Int. Cl.³ B01D *37/04*; C02F *1/52*
U.S. Cl. 210—741 **9 Claims**



1. In a continuous process for the clarification of a liquid medium containing solid particulate matter, the improvement which comprises the steps of

(a) continuously passing a stream of the liquid medium containing solid particulate matter through a first separator means to remove from the stream solid matter having a nominal diameter of greater than about 3 millimeters;

(b) discharging from the first separator means a stream of the liquid medium containing solid particulate matter having a nominal diameter of less than about 3 millimeters;

(c) pressurizing said stream of the liquid medium discharged from the first separator means and passing said pressurized liquid stream through a second pressurized separator means;

(d) removing from the liquid stream in the second pressurized separator means solid particulate matter having a nominal diameter greater than about 75 microns and a density greater than about 1.3 times the density of the liquid medium;

(e) discharging the pressurized stream of the liquid medium from the second separator means while maintaining a substantially constant pressure differential across the second separator by volumetric flow rate control means downstream of the second separator;

(f) delivering the pressurized stream of the liquid medium discharged from the second separator means to a pressurized fine filter means and separating from said liquid medium and retaining therein solid particles having a nominal diameter greater than about 1 micron while maintaining the flow rate within a predetermined range;

(g) maintaining the flow rate through the fine filter means by variable discharge flow rate control means intermediate the second separator means and fine filter means whereby a portion of the pressurized stream of the liquid medium is discharged to collection means at atmospheric pressure for re-cycling to the first separator means; and

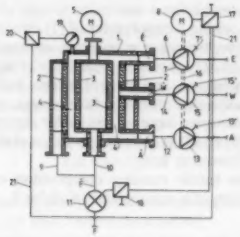
(h) discharging from the fine filter means a continuous stream of clarified liquid medium.

4,427,552

METHOD OF AUTOMATICALLY CONTROLLING A CONTINUOUSLY OPERATING PRESSURE FILTER

Jürg Lieberherr, Zumikon; Ernst Rebsamen, Thalwil; Felix Trachsel, Windisch, and Ludwig Huser, Niederrohrdorf, all of Switzerland, assignors to Sulzer-Escher Wyss Limited, Zurich, Switzerland

Filed Jan. 27, 1983, Ser. No. 461,473
Claims priority, application Switzerland, Feb. 9, 1982, 774/82
Int. Cl.³ B01D *33/40*
U.S. Cl. 210—741 11 Claims



1. A method of automatically controlling a continuously operating pressure filter, said method comprising the steps of:

introducing a flow of a suspension at a first rate of flow into a filtering chamber formed in said pressure filter and containing filtering walls;

removing a flow of a filtrate at a second rate of flow from said filtering chamber;

removing a flow of a product at a third rate of flow from said filtering chamber;

maintaining a substantially constant tolerated operating pressure within said filtering chamber;

the transmission capacity of said filtering walls in said filtering chamber gradually decreasing with increasing operating time of said pressure filter;

measuring the transmission capacity of the filtering walls;

during operation regulating said first and said third rate of flow in accordance with an obtained measuring result concerning said transmission capacity; and

reducing each of said first and said third rate of flow by a same coefficient in correspondence to a measured decrease in said transmission capacity, said coefficient being directly proportional to the corresponding value of the measured decrease;

whereby a desired ratio of said first and said third rate of flow is obtained at the beginning of the operation and is maintained essentially constant and remains essentially constant during operation.

4,427,553

REMOVAL OF SOLIDS FROM A COOLING TOWER BASIN

Sharon R. Fore, Old Ocean, Tex., assignor to Phillips Petroleum Company, Bartlesville, Okla.

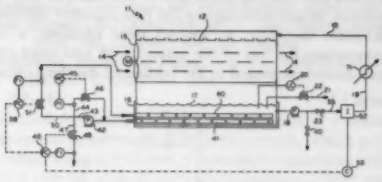
Division of Ser. No. 285,701, Jul. 22, 1981, Pat. No. 4,389,351.
This application Sep. 27, 1982, Ser. No. 424,800
Int. Cl.³ B01D *47/00*
U.S. Cl. 210—743 11 Claims

1. A method for removing substances in a cooling tower basin from the cooling tower basin comprising:

(a) passing an aqueous flush fluid into the cooling tower basin through a perforated flush tube means which extends into the cooling tower basin,

(b) agitating and mixing substances in the cooling tower basin with the aqueous flush fluid of (a),

(c) withdrawing substances in the cooling tower basin and the aqueous flush fluid of (a) from the cooling tower basin,



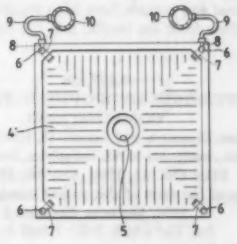
using a separate perforated removal tube means which extends into the basin.

4,427,554

METHOD FOR APPLYING A SECONDARY FILTER LAYER OR PRECOAT LAYER IN A PLATE FILTER PRESS, AND PLATE FILTER PRESS FOR PERFORMING THE METHOD

Oswald Busse, and Hugo Klesper, both of Aarbergen, Fed. Rep. of Germany, assignors to Passavant-Werke AG & Co. KG, Fed. Rep. of Germany

Filed Jun. 28, 1982, Ser. No. 393,025
Claims priority, application Fed. Rep. of Germany, Jul. 7, 1981, 3129736
Int. Cl.³ B01D *25/12, 37/02*
U.S. Cl. 210—777 4 Claims



1. The method for applying a secondary filter layer or precoat layer to the filter cloths of a plate filter press by feeding a suspension comprising a carrier medium containing a secondary filter medium or precoat medium from one or both ends of the filter press into the chambers of the filter press and draining the carrier medium passing through the filter cloths out of the filter press, the improvement comprising, draining at least a part of the carrier medium out of the filter press at a plurality of drainage points distributed along the length of the filter press, and throttling the drainage of the carrier medium to build up pressure in the filter chamber.

4,427,555

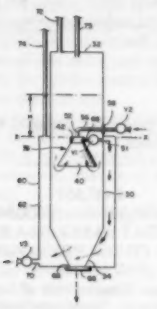
FILTER SYSTEM

Robert L. Brown, Tewksbury, and Wesley M. Tufts, Holliston, both of Mass., assignors to Control Fluidics, Inc., New York, N.Y.

Filed Dec. 27, 1982, Ser. No. 452,950
Int. Cl.³ C02C *1/18*
U.S. Cl. 210—805 24 Claims

1. A filter system comprising means defining a first chamber containing fluid up to a predetermined level, a shroud positioned in the chamber immersed in the fluid, said shroud defining a downwardly-open second chamber, a quantity of discrete, buoyant bodies supported in the shroud by flotation, said discrete, buoyant bodies defining a filter medium, a conductor connected to the top of the shroud for delivering fluid to the

shroud at a pressure to disperse the discrete bodies downwardly therein as the fluid is forced downwardly into the shroud and into the lower part of the first chamber below the shroud, means surrounding the first chamber defining in conjunction therewith an annular third chamber, a conductor connecting the top of the shroud with said third chamber, a conductor connected to the bottom of the third chamber providing an outlet from the bottom and valves in the several conductors operable on the one hand to admit fluid into the shroud and to prevent fluid to be withdrawn from the third chamber while blocking flow of fluid from the shroud to the third chamber and on the other hand to terminate flow of fluid into the shroud and prevent flow from the third chamber while permitting flow from the shroud into the third chamber.



4,427,556

DISPERSIBLE HYDROPHILIC POLYMER COMPOSITIONS

Roy F. House, Houston, and Lonnie D. Hoover, Chappell Hill, both of Tex., assignors to NL Industries, Inc., New York, N.Y.

Filed Oct. 14, 1980, Ser. No. 196,367

The portion of the term of this patent subsequent to May 18, 1999, has been disclaimed.

Int. Cl.³ C09K *7/02*; E21B *43/00*

U.S. Cl. 252—8.5 A **23 Claims**

1. A polymer composition for use in thickening aqueous mediums comprising a particulate, organic polymer selected from the group consisting of cellulose derivatives, starch derivatives, polysaccharide gums, and mixtures thereof which is water dispersible, increases the viscosity or decreases the fluid loss of an aqueous medium, and normally forms agglomerates upon addition to an aqueous medium, a solvating agent comprising a water miscible, polar organic liquid selected from the class consisting of aliphatic glycols containing from 2 to 5 carbon atoms, alkylene triols containing from 3 to 5 carbon atoms, polyalkylene glycols containing 4 to 9 carbon atoms, amides containing from 1 to 4 carbon atoms, and mixtures thereof, which solvating agent when uniformly mixed with said polymer in a weight ratio of polymer to solvating agent of 1:2 produces a mixture with substantially no free liquid solvating agent present after remaining quiescent for one week at ambient temperature in a sealed container, a diluting agent, said diluting agent comprising an organic liquid which is not a solvating agent, wherein the weight ratio of said solvating agent and a compatibilizing agent capable of increasing the viscosity of said diluting agent, to said polymer in said composition is from about 1:1 to about 5:1, and wherein said compatibilizing agent comprises the reaction product of a methyl benzyl dialkyl ammonium compound wherein the ammonium compound contains 20 to 75% alkyl groups having 18 carbon atoms, and a smectite-type clay having cationic exchange capacity of at least 75 milliequivalents per hundred grams of said clay, and wherein the amount of said ammonium compound is from about 100 to 120 milliequivalents per hundred grams of said clay, 100% active clay basis.

4,427,557

ANIONIC TEXTILE TREATING COMPOSITIONS

George J. Stockburger, Wilmington, Del., assignor to ICI Americas Inc., Wilmington, Del.

Continuation-in-part of Ser. No. 263,445, May 14, 1981, abandoned. This application Feb. 15, 1983, Ser. No. 466,580

Int. Cl.³ D06M *9/00*

U.S. Cl. 252—8.7 **20 Claims**

1. A copolyester having a molecular weight of from 2,000 to 10,000 and comprising a copolyester of (1) ethylene glycol, (2) polyethylene glycol having an average molecular weight of from 200 to 1000, (3) aromatic dicarboxylic acid containing only carbon, hydrogen, and oxygen atoms, and (4) an alkali metal salt of a sulfonated aromatic dicarboxylic acid containing only carbon, hydrogen, oxygen, and sulfur atoms, wherein the molar ratio of (2) to (4) is from 0.1 to 2.0, and the molar ratio of (3) to (4) is from 1 to 8.

5. An anionic textile treating composition comprising an aqueous dispersion of a copolyester of claim 1.

4,427,558

FABRIC CONDITIONING MATERIALS

John G. David, Wirral, England, assignor to Lever Brothers Company, New York, N.Y.

Filed Apr. 26, 1982, Ser. No. 371,645

Claims priority, application United Kingdom, May 8, 1981, 8114134

Int. Cl.³ D06M *13/40, 13/46*

U.S. Cl. 252—8.8 **7 Claims**

1. A method of producing fabric softening particles characterised by the steps of

(i) forming a liquid mixture comprising:

(A) from about 4% to about 80% by weight of a cationic fabric conditioning material;

(B) from about 10% to about 90% by weight of urea;

(C) from about 2% to about 50% by weight of water; and

(D) from about 1% to about 50% by weight of an alkaline earth metal salt of a fatty acid having 8–30 carbon atoms, the weight ratio of fatty acid salt to cationic fabric conditioning material being between about 0.25:1 and about 0.5:1; and

(iii) transforming the liquid mixture so formed into solid particles having a particle size of from about 0.1 to about 2000 microns.

4,427,559

METHOD OF PREPARING OVERBASED CALCIUM SULFONATES

Joanne R. Whittle, Nederland, Tex., assignor to Texaco Inc., White Plains, N.Y.

Filed Jan. 26, 1981, Ser. No. 228,406

Int. Cl.³ C10M *1/40*

U.S. Cl. 252—33.2 **3 Claims**

1. A process for preparing a micellar dispersion of calcium carbonate-overbased calcium sultonate of high alkalinity which consists essentially of the steps of:

(a) mixing a neutral calcium sulfonate with a light hydrocarbon solvent and a lower alkanol;

(b) adding to the resulting mixture (1) a calcium oxide having a temperature rise of about 6° C. maximum in 30 seconds and a total slaking time of about 6 to 24 minutes, and (2) calcium hydroxide in a molar ratio of oxide to hydroxide and oxide ranging from about 0.2 to 1.0, with the ratio of oxide to hydroxide not exceeding 30%; the molar ratio of said alkanol to the sum of the moles of oxide and hydroxide ranging from about 0.5 to about 3.0; and the molar ratio of said hydrocarbon solvent to said neutral calcium sulfonate ranging from about 1.0 to 2.0;

(c) heating the resulting reaction mass to between about 100°

F. and 170° F. under a pressure ranging from about 0 to 50 psig;

(d) introducing into the heated mixture gaseous hydrocarbon dioxide in an amount sufficient to provide a molar ratio of CO_2 to said oxide and said hydroxide ranging from about 0.1 to 1.2;

(e) adding to the thus treated mass a diluent oil;

(f) separating the solids from the liquid in said mass; and

(g) heating said liquid to remove said solvent.

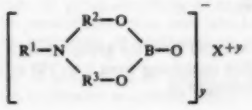
4,427,560
ANTI-OXIDATION AND CORROSION INHIBITORS FOR BORON-CONTAINING LUBRICANTS

Richard A. Holstedt, Whittier, Calif., and Peter Jessup, Millington, N.J., assignors to Union Oil Company of California, Los Angeles, Calif.

Filed Dec. 10, 1981, Ser. No. 329,384
Int. Cl.³ C10M *1/38*
U.S. Cl. 252—42.7 **37 Claims**

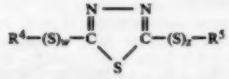
1. A lubricating composition comprising a major amount of a lubricating oil and a minor amount of:

(A) An extreme pressure, anti-wear and friction reducing boron compound of the formula:



wherein R^1 is hydrogen, alkyl, cyclic, alicyclic, aryl, alkylaryl, or arylalkyl radicals having from 1 to about 24 carbon atoms, R^2 and R^3 are the same or different, straight or branched carbon chains, cyclic, alicyclic, aryl, alkylaryl or arylalkyl radicals having from 2 to about 20 carbon atoms, y is a number from 1 to 4, and X is either hydrogen, a transition metal having an atomic number between 21 and 30 or a Group IVA metal of the Periodic Table and mixtures thereof;

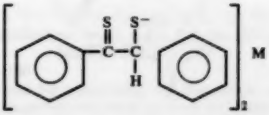
(B) A copper corrosion inhibitor comprising a hydrocarbon polysulfide derivative of 2,5-dimercapto-1,3,4-thiadiazole having the formula



wherein R^4 and R^5 are moieties selected from hydrogen or straight or branched chain alkyl, cyclic, alicyclic, aryl, alkylaryl or arylalkyl radicals having from 2 to about 30 carbon atoms, provided that R^4 and R^5 are not both hydrogen and w and z are numbers from 1 to about 8;

(C) a lead corrosion inhibitor comprising terephthalic acid; and

(D) an anti-oxidant comprising a bis(dithiobenzil) metal derivative having the formula:



wherein M is a first row transition metal having an oxidation state of +2.

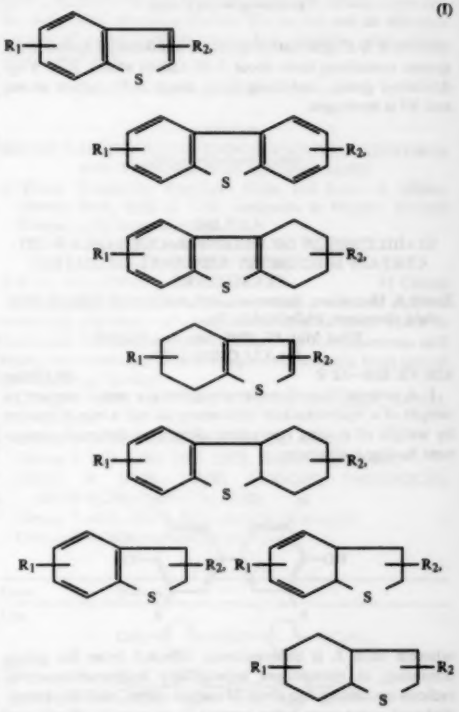
4,427,561
SULFUR COMPOUND CONTAINING LUBRICANT COMPOSITION FOR USE IN FLON ATMOSPHERE

Sampo Kusayanagi, Yokohama, and Ryuji Kimura, Urawa, both of Japan, assignors to Nippon Mining Co., Ltd., Tokyo, Japan

Filed Jun. 22, 1981, Ser. No. 276,291
Claims priority, application Japan, Jun. 20, 1980, 55-82872
Int. Cl.³ C10M *1/38, 1/42, 3/32, 3/36*
U.S. Cl. 252—45 **5 Claims**

1. A method for lubrication of machines used in a sealed Flon atmosphere substantially devoid of oxygen, which process comprises using a lubricant composition comprising mineral oil as a base oil, said composition containing at least one organic sulfur compound selected from the group consisting of the compounds of the following three formulae (I), (II) and (III):

(I)

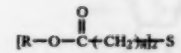


(wherein R_1 and R_2 which may be the same or different are each an alkyl group having 1 to 8 carbon atoms or hydrogen);

$$R_1—S—R_2 \quad \text{(II)}$$

(wherein R_1 and R_2 which may be the same or different are each an alkyl group having 4 to 12 carbon atoms, phenyl group, phenol group, benzyl group, naphthalene group or a derivative thereof having an alkyl substituent); and

(III)



(wherein R is an alkyl group having 4 to 8 carbon atoms or a phenyl group; and n is an integer of 2 to 8), said composition having a total sulfur content of from 0.14 to 0.6 wt%.

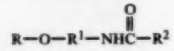
4,427,562

FRICTION REDUCERS FOR LUBRICANTS AND FUELS

Andrew G. Horodysky, Cherry Hill, and Milton Braid, Haddonfield, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Filed May 6, 1982, Ser. No. 375,413
Int. Cl.[3] C10M *1/32*
U.S. Cl. 252—51.5 A 8 Claims

1. A lubricant or fuel composition comprising a major amount of an oil of lubricating viscosity, a grease prepared therefrom or a liquid hydrocarbon fuel and a minor amount of an additive effective for providing friction reducing, copper anti-corrosion or antioxidant properties to said composition comprising an amide represented by the following formula:



wherein R is a hydrocarbyl group or a mixture of hydrocarbyl groups containing from about 5–30 carbon atoms; R^1 is a hydrocarbyl group containing from about 2–10 carbon atoms; and R^2 is hydrogen.

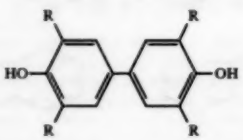
4,427,563

STABILIZATION OF HYDROCRACKED OILS WITH CERTAIN DIHYDROXY DIPHENYL OXIDATION STABILIZERS

David A. Hutchison, Hammond, Ind., assignor to Atlantic Richfield Company, Philadelphia, Pa.

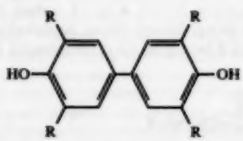
Filed May 15, 1980, Ser. No. 150,012
Int. Cl.[3] C10M *1/20*
U.S. Cl. 252—52 R 19 Claims

1. A composition of matter comprising a major amount by weight of a hydrocracked lubricating oil and a minor amount by weight of at least one added dihydroxy-diphenyl component having a structure:



wherein each R is independently selected from the group consisting of monovalent substantially hydrocarbonaceous radicals containing 1 to about 24 carbon atoms, said dihydroxy-diphenyl component being present in an amount effective to inhibit sunlight deterioration of said composition.

11. A method of inhibiting a hydrocracked lubricating oil from deterioration caused by sunlight comprising combining with said oil an inhibiting amount of at least one dihydroxy-diphenyl component having a structure:



wherein each R is selected from the group consisting of H and substantially monovalent hydrocarbonaceous radicals containing 1 to about 24 carbon atoms.

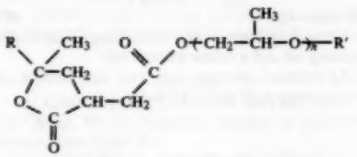
4,427,564

ADDITIVE COMPOSITION FOR RELEASE OF STUCK DRILL PIPE

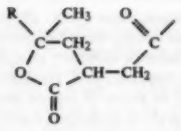
Darrell W. Brownawell, Scotch Plains; Antonio Gutierrez, Mercerville, both of N.J.; Patricia C. Matthews, Houston, and Thad O. Walker, Humble, both of Tex., assignors to Exxon Research & Engineering Co., Florham Park, N.J.

Filed Sep. 30, 1982, Ser. No. 428,825
Int. Cl.[3] C09K *7/00, 3/00*; E21B *3/00*
U.S. Cl. 252—8.55 R 8 Claims

1. An improved method of releasing a stuck drill string in the borehole of an underground formation during drilling operations employing a drilling fluid which comprises contacting said stuck drill string with an additive composition effective to reduce the annular pressure exerted by the drilling fluid against the stuck drill string and to release said stuck drill string, said additive composition being comprised of 5 to 25 weight percent of a propoxylated C_1–C_{150} lactone acid represented by the formula:

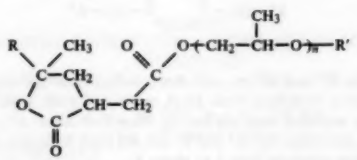


wherein R is selected from the group consisting of hydrogen and hydrocarbyl containing from 1 to 150 carbons, R′ is selected from hydrogen or

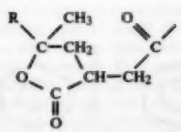


and n is an integer of from 3 to 40; from 4 to 20 weight percent a C_8–C_{22} fatty acid ester of a polyol or polyol anhydride; and, a liquid hydrocarbon diluent.

5. A stuck drill pipe additive composition comprising from 5 to 25 weight percent of a propoxylated lactone acid represented by the formula:



wherein R is selected from the group consisting of hydrogen and hydrocarbyl containing from 1 to 150 carbons, R′ is selected from hydrogen or



and n is an integer of from 3 to 40; from 4 to 20 weight percent an oil-soluble emulsifier-wetting agent; and, a hydrocarbon diluent.

4,427,565
NOVEL CLASS OF RUST INHIBITORS FOR FUELS AND OILS

Ellis K. Fields, River Forest, and Ronald L. Anderson, Naperville, both of Ill., assignors to Standard Oil Company (Indiana), Chicago, Ill.

Division of Ser. No. 287,156, Jul. 27, 1981, Pat. No. 4,388,470. This application Mar. 31, 1983, Ser. No. 480,889

Int. Cl.³ C10M *1/20*

U.S. Cl. 252—56 D **3 Claims**

1. Photo-adducts of dimethyl maleic anhydride and olefins as rust inhibitors in concentrations of about 0.0001 to 1 weight percent in fuels and oils.

4,427,566
WASHING COMPOSITIONS CONTAINING ORGANIC PERACID BLEACHES OR THEIR PRECURSORS AND IODIDE ION DONORS

Anthony H. Clements, Cefnoy bedd, Wales, assignor to Lever Brothers Company, New York, N.Y.

Filed Feb. 4, 1982, Ser. No. 345,908

Claims priority, application United Kingdom, Feb. 16, 1981, 8104826

Int. Cl.³ C11D *7/54*

U.S. Cl. 252—102 **13 Claims**

1. A composition for washing fabrics in aqueous media, comprising:

(a) about 0.5 to about 25% by weight of a peracid compound selected from the group consisting of organic peracids, peracid salts, peracid precursors from which peracids are liberated by hydrolysis or perhydrolysis and mixtures thereof; and

(b) about 0.002 to about 1.2% by weight of an iodide ion donor which is effective in aqueous media.

4,427,567
METHOD FOR RECONDITIONING OF POORLY FLOWING OR CAKED DETERGENT POWDERS

Claude L. Benz, Belle-Mead, N.J., assignor to Colgate-Palmolive Company, New York, N.Y.

Continuation of Ser. No. 640,792, Dec. 15, 1975, abandoned. This application Jun. 18, 1981, Ser. No. 275,052

Int. Cl.³ C11D *3/12, 11/00, 17/06*

U.S. Cl. 252—116 **1 Claim**

1. A method for reconditioning a caked detergent composition of about 18% sodium linear tridecylbenzene sulfonate, about 15% sodium silicate having an $Na_2O:SiO_2$ ratio of 1:2.35, about 5% sodium carbonate, about 50% sodium sulfate, about 1% of a C12 to C15 fatty alcohol-polyethylene oxide condensate having about 10 to 15 ethylene oxide units per molecule, about 1% sodium tallow soap, about 1% aluminum silicate clay, about 1.5% adjuvants and about 7.5% moisture, said percents being weight percents relative to the total weight of the composition, which comprises breaking up the caked detergent composition to form a detergent powder; and mixing about 100 parts of the detergent powder with about 3 parts of a type 4A molecular sieve having about 2% hydration and a particle size of about 6.5 to 8.3 microns to produce a molecular sieve coated, freely flowing detergent composition powder.

4,427,568
COMPOSITION FOR TREATING AQUEOUS MEDIUMS

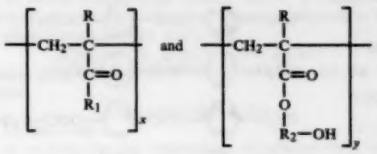
William R. Snyder, Warminster, and Diane Feuerstein, Bensalem, both of Pa., assignors to Betz Laboratories, Inc., Trevose, Pa.

Division of Ser. No. 254,842, Apr. 16, 1981, Pat. No. 4,324,664. This application Jan. 5, 1982, Ser. No. 337,195

Int. Cl.³ C02F *5/10*

U.S. Cl. 252—180 **6 Claims**

1. Composition for controlling the deposition of scale imparting precipitates on structural parts of a system exposed to an aqueous medium including scale imparting precipitates, under scale imparting conditions, said composition comprising an effective amount for the purpose of a water soluble polymer (I) comprising moieties (a) derived from an acrylic acid or water soluble salt thereof and moieties (b) of an hydroxylated lower alkyl acrylate, wherein the moieties of the polymer (I) have the following formula



wherein R is hydrogen or a lower alkyl of from 1 to 3 carbon atoms; R_1 is OH, OM, or NH_2 where M is a water soluble cation; R_2 is a lower alkyl of from about 2–6 carbon atoms and the molar ratio of x to y is about 34:1 to 1:4, and an effective amount of a water soluble ester of an aliphatic sulphodicarboxylic acid (II).

4,427,569
SHORT LENGTH ESTER LIQUID CRYSTAL MIXTURES AND PROCESS FOR MAKING SAME

J. David Margerum, Woodland Hills, and Leroy J. Miller, Canoga Park, both of Calif., assignors to Hughes Aircraft Company, El Segundo, Calif.

Filed Dec. 18, 1980, Ser. No. 217,619

Int. Cl.³ C09K *3/34*; G02F *1/13*

U.S. Cl. 252—299.63 **11 Claims**

1. Liquid crystal mixtures comprising a eutectic mixture consisting essentially of components selected from Table A herein and including at least one binary set of components, said binary set consisting of two components selected from one of the following Groups:

Group 1: 1S04, 10-4, 10S4, 10-OOC3, 20-3, 20S3, 20-(C)3, 40S1;

Group 2: 10-04, 10S04, 10S5, 10-(C)5, 40-01;

Group 3: 1-06, 1S06, 20-5, 20S5, 20-(C)5, 40-3, 40S3;

Group 4: 10-06, 10S06, 2-OOCϕ2, 2-(Cl)OOCϕ2, 2ϕCOO(CH_3)-2, 40-(C)4, 60-01;

Group 5: 40-6, 40-05, 40S6, 40-OOC4, 60-(C)4;

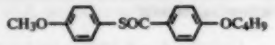
Group 6: 4-OOCϕ4, 4ϕCOO(CH_3)-4;

TABLE A

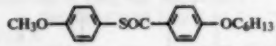
Code	Structure
1-06	CH_3—ϕ—OOC—ϕ—OC_6H_{13}
10-1	CH_3O—ϕ—OOC—ϕ—CH_3
10-4	CH_3O—ϕ—OOC—ϕ—C_4H_9
10-04	CH_3O—ϕ—OOC—ϕ—OC_4H_9
10-06	CH_3O—ϕ—OOC—ϕ—OC_6H_{13}
1604	CH_3—ϕ—SOC—ϕ—OC_4H_9
1606	CH_3—ϕ—SOC—ϕ—OC_6H_{13}
1064	CH_3O—ϕ—SOC—ϕ—C_4H_9
1065	CH_3O—ϕ—SOC—ϕ—C_5H_{11}

TABLE A-continued

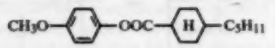
10604



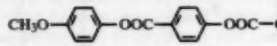
10606



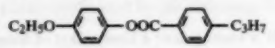
10-(C)5



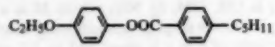
10-OOC3



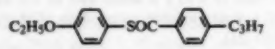
20-3



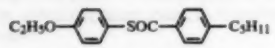
20-5



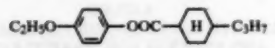
2063



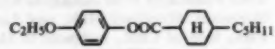
2065



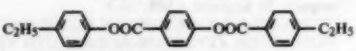
20-(C)3



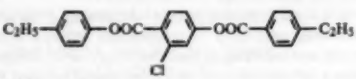
20-(C)5



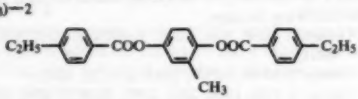
2-OOCϕ2



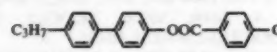
2-(Cl)OOCϕ2



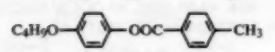
2ϕCOO(CH3)—2



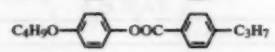
3ϕ-4



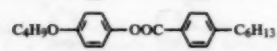
40-1



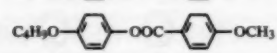
40-3



40-6



40-01



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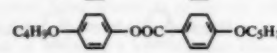

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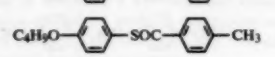

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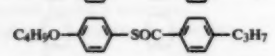

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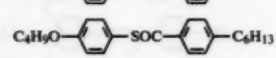
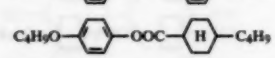
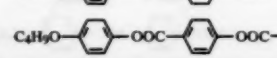


40-(C)4



40-OOC4



4-OOCϕ4

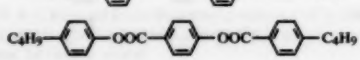
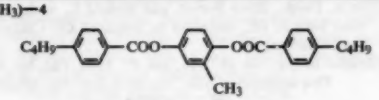
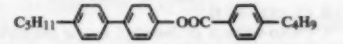


TABLE A-continued

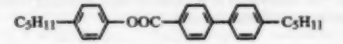
4ϕCOO(CH3)—4



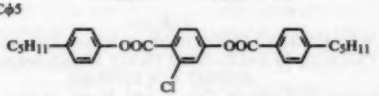
5ϕ-4



5-ϕ5



5-(Cl)OOCϕ5



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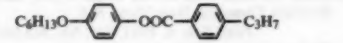

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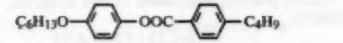

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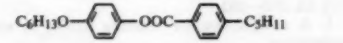

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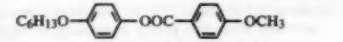
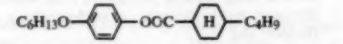
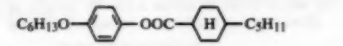


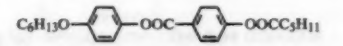
60-(C)4



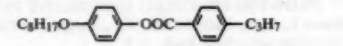
60-(C)5



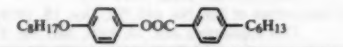
60-OOC5



80-3



80-6



Code	Name
1-06	p-tolyl p-hexoxybenzoate
10-1	p-methoxyphenyl p-toluate
10-4	p-methoxyphenyl p-butylbenzoate
10-04	p-methoxyphenyl p-butylbenzoate
10-06	p-methoxyphenyl p-hexoxybenzoate
1604	p-tolyl p-butoxythiobenzoate
1606	p-tolyl p-hexoxythiobenzoate
1064	p-methoxyphenyl p-butylthiobenzoate
1065	p-methoxyphenyl p-pentylthiobenzoate
10604	p-methoxyphenyl p-butoxythiobenzoate
10606	p-methoxyphenyl p-hexoxythiobenzoate
10-(C)5	p-methoxyphenyl trans-4-pentyl-cyclohexanecarboxylate
10-OOC3	p-methoxyphenyl p-butyryloxybenzoate
20-3	p-ethoxyphenyl p-propylbenzoate
20-5	p-ethoxyphenyl p-pentylbenzoate
2063	p-ethoxyphenyl p-propylthiobenzoate
2065	p-ethoxyphenyl p-pentylthiobenzoate
20-(C)3	p-ethoxyphenyl trans-4-propyl-cyclohexanecarboxylate
20-(C)5	p-ethoxyphenyl trans-4-pentyl cyclohexanecarboxylate
2-OOCϕ2	p-ethylphenyl p-(p-ethylbenzoyloxy)benzoate
2-(Cl)OOCϕ2	p-ethylphenyl p-(p-ethylbenzoyloxy)-o-chlorobenzoate
2ϕCOO(CH3)-2	2-methyl-1,4-phenylene di(4-ethylbenzoate)
3ϕ-4	4-propylbiphenyl-4'-yl p-butylbenzoate
40-1	p-butoxyphenyl p-toluate
40-3	p-butoxyphenyl p-propylbenzoate
40-6	p-butoxyphenyl p-hexylbenzoate
40-01	p-butoxyphenyl p-methoxybenzoate
40-05	p-butoxyphenyl pentyloxybenzoate
4061	p-butoxyphenyl p-thiotoluate
4063	p-butoxyphenyl p-propylthiobenzoate

TABLE A-continued

4066	p-butoxyphenyl p-hexylthiobenzoate
40-(C)4	p-butoxyphenyl trans-4-butyl-cyclohexanecarboxylate
40-OOC4	p-butoxyphenyl p-valeryloxybenzoate
4-OOCϕ4	p-butylphenyl p-(p-butylbenzoyloxy)benzoate
4ϕCOO(CH3)-4	2-methyl-1,4-phenylene di(4-butylbenzoate)
5ϕ-4	4-pentylbiphenyl-4'-yl 4-butylbenzoate
5-ϕ5	p-pentylphenyl 4''-pentylbiphenyl-4'-carboxylate
5-(C)OOCϕ5	p-pentylphenyl p-(p-pentylbenzoyloxy)-o-chlorobenzoate
60-3	p-hexoxyphenyl p-propylbenzoate
60-4	p-hexoxyphenyl p-butylbenzoate
60-5	p-hexoxyphenyl p-pentylbenzoate
60-01	p-hexoxyphenyl p-methoxybenzoate
60-(C)4	p-hexoxyphenyl trans-4-butyl-cyclohexanecarboxylate
60-(C)5	p-hexoxyphenyl trans-4-pentyl-cyclohexanecarboxylate
60-OOC5	p-hexoxyphenyl p-hexanoyloxybenzoate
80-3	p-octyloxyphenyl p-propylbenzoate
80-6	p-octyloxyphenyl p-hexylbenzoate.

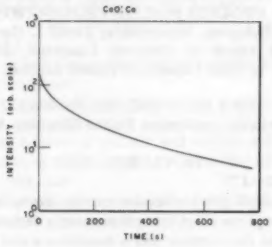
4,427,570
HIGH-QUANTUM EFFICIENCY, LONG-LIVED LUMINESCING REFRACTORY OXIDES

Yok Chen, Oak Ridge; Roberto Gonzalez, Knoxville, both of Tenn., and Geoffrey P. Summers, Stillwater, Okla., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Dec. 7, 1982, Ser. No. 447,729

Int. Cl.³ C09K 11/12; C01F 5/00

U.S. Cl. 252—301.4 R **3 Claims**



1. A crystal formed of an oxide selected from the group consisting of magnesium oxide and calcium oxide and possessing a concentration ratio of H^- ions to F centers in the range of about 0.05 to about 10.

4,427,571
COMPOSITION FOR STRIPPING GOLD OR SILVER FROM PARTICULATE MATERIALS

Alan J. Parker, South Perth, and David M. Muir, Murdoch, both of Australia, assignors to Anumin Pty. Ltd., Murdoch, Australia

Filed Nov. 20, 1981, Ser. No. 323,558

Claims priority, application Australia, Nov. 26, 1980, PE6633; Jan. 2, 1981, PE7115

Int. Cl.³ B01F 1/00

U.S. Cl. 252—364 **6 Claims**

1. A composition for use in separating gold or silver from particulate material on which it is adsorbed, which comprises a homogeneous phase mixture of aqueous solvent having dissolved therein at least 20% by volume of a polar organic solvent or a mixture of polar organic solvents selected from the group consisting of organic nitriles containing up to 3 carbon atoms, said solvent mixture containing from 0.1% by weight to saturation of a water soluble inorganic cyanide or thiocyanate salt which produces free cyanide or thiocyanate ions in water.

4,427,572
PROCESS FOR THE MANUFACTURE OF SOAP

John B. Akers, South Wirral; Jane A. Littler, Warrington, and David C. Peters, Heswall, all of England, assignors to Lever Brothers Company, New York, N.Y.

Filed Jul. 21, 1981, Ser. No. 285,665

Claims priority, application United Kingdom, Jul. 24, 1980, 8024344

Int. Cl.³ C11D 13/00

U.S. Cl. 252—369 **5 Claims**

1. A process for the production of calcium soap, which comprises saponifying an organic carboxylic acid having from 6 to 24 carbon atoms in the molecule, its ester or mixtures thereof with calcium hydroxide in a liquid reaction medium comprising a dipolar aprotic solvent having a dielectric constant of above 15, separating the calcium soap from the reaction medium, and removing excess dipolar aprotic solvent from the calcium soap.

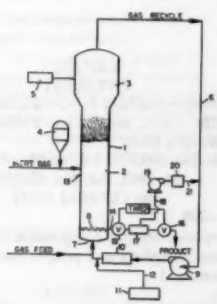
4,427,573
POLYMERIZATION CATALYST, PROCESS FOR PREPARING, AND USE FOR ETHYLENE POLYMERIZATION

David L. Miles, Neshanic; Frederick J. Karol, and George L. Goeke, both of Belle Mead, Burkhard E. Wagner, Highland Park, all of N.J., assignors to Union Carbide Corporation, Danbury, Conn.

Filed Sep. 16, 1981, Ser. No. 302,846

Int. Cl.³ C08F 4/64

U.S. Cl. 502—111 **10 Claims**



1. A process for preparing a partially activated precursor composition, in the presence of an insoluble porous support, which comprises

dissolving in an electron donor solvent

at least one titanium compound; at least one magnesium compound; and at least one activator compound;

said titanium compound having the structure $Ti(OR)_aX_b$

wherein R is a C_1 to C_{14} aliphatic or aromatic hydrocarbon radical, or COR^I wherein R^I is a C_1 to C_{14} aliphatic or aromatic hydrocarbon radical,

X is selected from the group consisting of Cl, Br, I or mixtures thereof

a is 0 to 4 inclusive; b is 0 to 4 inclusive and a+b=3 or 4;

said magnesium compound having the structure MgX_2^I, wherein X^I is selected from the group consisting of Cl, Br I or mixtures thereof;

said electron donor solvent being a liquid organic compound in which said magnesium compound and said titanium compound are soluble and which is selected from the group consisting of alkyl esters of aliphatic carboxylic acids, aliphatic ethers, and cyclic ethers,

said activator compound having the formula

$$Al(R^{IV})_cX_d^{II}H_e$$

wherein X^{II} is Cl or OR^V, R^{IV} and R^V are the same or different C_1 to C_{14} saturated hydrocarbon radicals, d is 0 to 1.5, e is 1 or 0 and c+d+e=3, and

impregnating said partially activated precursor composition into said support by drying,

said magnesium compound being present from about 0.5 to 56 mols per mol of titanium compound,

said activator compound being present in excess of one mol per mol of titanium and

said porous support being present from about 50 to about 95 weight percent based on the total weight of the solid composition.

4,427,574

CATALYSTS

Edward K. Pierpoint, Largs, Scotland, assignor to Imperial Chemical Industries PLC, London, England

Filed Jun. 14, 1982, Ser. No. 388,168

Claims priority, application United Kingdom, Aug. 14, 1981, 8124940; Aug. 21, 1981, 8125678

Int. Cl.³ B01J *31/30*

U.S. Cl. 502—154 6 Claims

1. In an improved platinum catalyst of the type resulting from the admixture of a haloplatinum compound and an aliphatically unsaturated organosiloxane compound, the improvement which comprises the inclusion of an aluminium alkoxide.

4,427,575

CATALYST

Marvin M. Johnson; Gerhard P. Nowack, and Simon Kukes, all of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 395,939, Jul. 7, 1982. This application Apr. 26, 1983, Ser. No. 488,881

Int. Cl.³ B01J *27/14*

U.S. Cl. 502—208 4 Claims

1. An amorphous catalyst composition comprising:

(a) zirconium phosphate and at least one of

(b) chromium, and

(c) thorium.

4,427,576

CATALYST FOR OXIDATION OF HYDROGEN SULFIDE AND/OR ORGANOSULFUR COMPOUNDS TO SO_2 AND PROCESS FOR PREPARING THE CATALYST

Thierry Dupin, Garges, France, assignor to Rhone-Poulenc Specialites Chimques, Courbevoie, France

Filed Mar. 1, 1982, Ser. No. 353,243

Claims priority, application France, Mar. 13, 1981, 81 05030

Int. Cl.³ B01J *21/06, 21.08, 23/02, 27/02*

U.S. Cl. 502—218 37 Claims

1. A long-lived catalyst composition, consisting essentially of (i) titanium dioxide, or admixture of titanium dioxide with zirconia or silica, (ii) an alkaline earth metal sulfate, and (iii) at least one of the elements copper, silver, zinc, cadmium, yttrium, lanthanides, vanadium, chromium, molybdenum, tungsten, manganese, iron, cobalt, rhodium, iridium, nickel, palladium, platinum, tin and bismuth, the amount by weight of the component (i) therein, relative to the total weight thereof, ranging from about 60 to about 99%.

4,427,577

COMPOSITE ZEOLITE

Wicher T. Koetsier, Mijnsheerenland, Netherlands, assignor to Exxon Research & Engineering Co., Florham Park, N.J.

Filed Dec. 4, 1981, Ser. No. 327,175

Claims priority, application United Kingdom, Dec. 12, 1980, 8039997

Int. Cl.³ B01J *29/28*

U.S. Cl. 502—66 24 Claims

1. A catalyst composition comprising a crystalline modified-silica zeolite having a constraint index of from 1 to 12 overlying a silica core having substantially the same crystalline structure as the modified-silica zeolite.

2. A catalyst composition comprising a crystalline modified-silica zeolite having a constraint index of from 1 to 12 overlying a silica core, in which the silica core is a silica polymorph of analogous structure to the modified-silica zeolite, so that the silica core alone and the complete catalyst display substantially the same x-ray diffraction patterns.

19. A process for the preparation of a composite zeolite comprising a silica core with an overlying modified-silica zeolite having a tetrahedral silica network substituted by a modifying element, in which process preformed particles of silica are placed in a crystallisation gel for the modified-silica zeolite comprising a silica source and a source of the modifying element and the crystallisation gel is maintained under appropriate reaction conditions to bring about formation on the silica particles of a modified-silica zeolite having a constraint index of from 1 to 12, the silica having substantially the same crystalline structure as the modified-silica zeolite.

4,427,578

AMORPHOUS SILICA-BASED CATALYST AND PROCESS FOR ITS PRODUCTION

Joseph G. Robinson, Winchcombe; David I. Barnes, Cheltenham, and Angela M. Carswell, Longhope, all of England, assignors to Coal Industry (Patents) Limited, London, England

Filed Jul. 7, 1982, Ser. No. 396,132

Claims priority, application United Kingdom, Aug. 18, 1981, 8125108

Int. Cl.³ B01J *21/08*

U.S. Cl. 502—177 8 Claims

1. A synthesis gas conversion catalyst comprising a highly porous amorphous silica xerogel support, a monolayer of silica deposited on the support, and a transition metal impregnated onto the silica-coated support, the catalyst having a maximum pore diameter of up to 5 nm and an average pore diameter of up to 1.5 nm.

4,427,579

METHOD OF PRODUCING FUGITIVE BINDER-CONTAINING NUCLEAR FUEL MATERIAL

George L. Gaines, Jr., Scotia; Patricia A. Piacente; William J. Ward, III, both of Schenectady, all of N.Y.; Peter C. Smith, Wilmington, N.C.; Timothy J. Gallivan, Wilmington, N.C., and Harry M. Laska, Wilmington, N.C., assignors to General Electric Company, Schenectady, N.Y.

Filed Dec. 17, 1981, Ser. No. 331,492

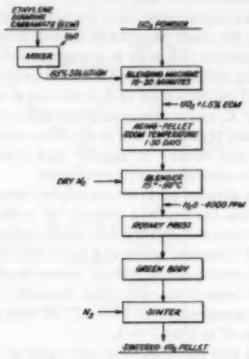
Int. Cl.³ C09K *3/00*; G21C *21/00*

U.S. Cl. 252—639 11 Claims

1. In the method of producing a sintered body of nuclear fuel material including the steps of pressing a particulate nuclear fuel material to form a green body compact and thereafter sintering the compact, the improvement of adding at least one amine compound selected from the group consisting of amine carbonates and amine carbamates to the particulate nuclear fuel material and reacting the resulting mixture in the presence of H_2O prior to the pressing step.

6. The composition of matter of claim 5 in combination with

nuclear fuel particulate material, said composition of matter being on the surface of said particulate material and the amine



compound used being present from about 0.5% to about 7% by weight of said nuclear fuel particulate material.

4,427,580

METHOD FOR SEPARATION AND RECOVERY OF PROTEINS AND NUCLEIC ACIDS FROM NUCLEOPROTEINS USING WATER DESTRUCTURING SALTS

John E. Kinsella, and Damodaran Srinivasan, both of Ithaca, N.Y., assignors to Cornell Research Foundation, Inc., Ithaca, N.Y.

Filed Sep. 1, 1982, Ser. No. 414,086
Int. Cl.³ A23J *1/18*
U.S. Cl. 260—112 R **6 Claims**

1. A method of reducing nucleic acid in microbially derived protein which comprises:

(a) disrupting microbial cells to provide a mixture comprising protein and nucleic acid,

(b) mixing the mixture of protein and nucleic acid with an effective nucleoprotein complex dissociating amount of a chaotropic salt, and

(c) reducing the pH to isoelectrically precipitate a nucleic acid diminished protein concentrate.

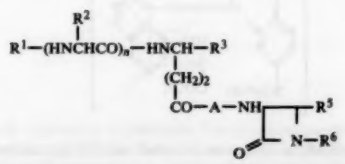
4,427,581

PEPTIDE, PROCESS FOR PREPARATION THEREOF AND USE THEREOF

Yoshio Miyazaki, Itami; Osamu Nakaguchi, Toyonaka, and Masashi Hashimoto, Takarazuka, all of Japan, assignors to Fujisawa Pharmaceutical Co., Ltd., Osaka, Japan

Filed Jan. 20, 1982, Ser. No. 341,058
Claims priority, application United Kingdom, Jan. 29, 1981, 8102705; Jun. 29, 1981, 8120033; Jul. 24, 1981, 8122991
Int. Cl.³ C07C *103/52*
U.S. Cl. 260—112.5 R **61 Claims**

1. A compound of the following formula or its pharmaceutically acceptable salt:



wherein

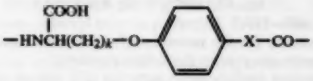
R^1 is hydrogen or acyl;

wherein the acyl may be substituted by a member of the group consisting of amino, halogen, hydroxy, protected hydroxy or carboxy;

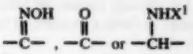
R^2 is lower alkyl;

R^3 is carboxy or protected carboxy;

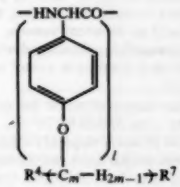
A is a bond, a group of the formula:



wherein X is a group of the formula:



wherein X^1 is hydrogen or an amino protective group, and k is an integer of 1 to 4; or a group of the formula:



wherein R^4 is amino or protected amino,

R^7 is carboxy or protected carboxy,

m is an integer of 1 to 8, and l is an integer of 1 or 0;

R^5 is hydrogen, carboxy or esterified carboxy;

R^6 is hydrogen, ar(lower)alkyl wherein the alkyl moiety may have carboxy or protected carboxy and the aryl moiety may have one or more substituents selected from hydroxy, protected hydroxy and lower alkoxy; and

n is an integer of 1 or 0.

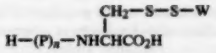
4,427,582

ANTIMICROBIAL DISULFIDE PRODRUGS

Charles Gilvarg, Princeton, N.J., and William D. Kingsbury, King of Prussia, Pa., assignors to SmithKline Beckman Corporation, Philadelphia, Pa.

Filed Jun. 8, 1982, Ser. No. 386,365
Int. Cl.³ C07C *103/52*; A61K *37/00*
U.S. Cl. 260—112.5 R **17 Claims**

1. An antimicrobial composition comprising an antimicrobially effective and nontoxic quantity of a compound of the structural formula:



in which:

n is an integer of from 1-5;

P is, individually, alanyl, ornithyl, lysyl or phenylalanyl; and

W is a residue of an antimicrobial mercaptan, said compound having the L-configuration at the carrying C-unit; or a salt thereof with a pharmaceutically acceptable acid or base; combined with an antimicrobial carrier thereof.

4,427,583
PROTEIN PRODUCTION

Richard England, Combe Down; John E. L. Bowcott, Bath; John S. Olds, Leighton Buzzard, and Alan Jobling, Harpenden, all of England, assignors to Lensfield Products Limited, Bedford, England

Filed Oct. 2, 1981, Ser. No. 308,033

Claims priority, application United Kingdom, Oct. 7, 1980, 8032267

Int. Cl.[3] **C07G** *7/00;* **A23J** *1/10*

U.S. Cl. 260—123.7 **1 Claim**

1. A process for the recovery of edible ossein protein from animal bone comprising the following steps:

(a) crushing fresh bone to particles of 7 mm or less.

(b) defatting the bone particles to reduce the fat content thereof to not more than 5% on a dry weight basis,

(c) mixing the defatted bone particles in dilute hydrochloric acid, which has already contacted bone particles, in a first treatment vessel to form a mixture of bone particles freely suspended in acid,

(d) passing the bone particles in counterflow to dilute hydrochloric acid through a series of treatment vessels, containing said dilute hydrochloric acid in which the particles are maintained in suspension by agitation thereof, by separating bone particles from the acid in passage thereof between treatment vessels and passing the separated bone particles and acid to different vessels,

(e) during step (d) supplying fresh acid in a strength of 6% to 8% by weight to a treatment vessel other than the first treatment vessel,

(f) controlling the temperature of the mixture in the treatment vessels to a maximum of 25° C.,

(g) continuing the process steps (d) through (f) so that in a few hours the bone particles are substantially demineralised, and

(h) separating and washing said demineralised bone particles to recover the edible ossein protein solid product.

4,427,584
CONVERSION OF CELLULOSIC FIBERS TO MONO-SUGARS AND LIGNIN

Ferdinand LeGrand, and Seymour S. Block, both of Gainesville, Fla., assignors to University of Florida, Gainesville, Fla.

Continuation-in-part of Ser. No. 295,814, Aug. 24, 1981, abandoned. This application May 5, 1982, Ser. No. 374,949

Int. Cl.[3] **C07G** *1/00;* **C07H** *1/00;* **C13K** *1/02*

U.S. Cl. 260—124 R **21 Claims**

1. A process for converting crystalline alpha-cellulose to amorphous alpha-cellulose which comprises the sequential steps of:

a. subjecting fiber particles containing crystalline alpha-cellulose and 20–30% moisture to a mixture of air and liquid or gaseous SO_3 at a temperature of not greater than about 80° C., the amount of SO_3 being 10–50% of the total amount of SO_3 needed to completely decrystallize said alpha-cellulose;

b. simultaneously drying the treated fiber particles in said mixture of air and SO_3;

c. subjecting said dried fiber particles to the remaining 50–90% of liquid or gaseous SO_3 in air at ambient temperature to produce a final concentration of at least 75% of H_2SO_4 formed in situ on said fiber particles;

d. subjecting the resulting mixture of concentrated H_2SO_4 and fiber particles to abrasion under pressure of at least 175 psi for a reaction time of 4–8 minutes at a temperature of 80°–150° C. to dissolve crystalline alpha-cellulose; and

e. recovering fibers containing acidified amorphous alpha-cellulose, hemicellulose, and lignin, and being substantially free of crystalline alpha-cellulose.

16. A process for converting cellulose to glucose and xylose comprising:

a. reducing the particle size of fibers containing alpha-cellulose to about 10 mesh;

b. subjecting said fiber particles at a moisture content of 20–30% to a mixture of air and liquid or gaseous SO_3 at a temperature of not greater than 80° C., the amount of SO_3 being 10–50% of that needed to completely decrystallize the alpha-cellulose in said particles;

c. drying the treated particles in the mixture of air and SO_3;

d. subjecting the dried particles to the remaining 50–90% of liquid or gaseous SO_3 in air at a temperature of 20°–30° C.;

e. abrading the resulting treated particles under a pressure of at least 175 psi for a time of 4–8 minutes at a temperature of 80°–150° C. to dissolve crystalline alpha-cellulose in the concentrated H_2SO_4 formed in situ from said SO_3 and said moisture, and thereby to convert said crystalline alpha-cellulose to amorphous alpha-cellulose.

f. feeding the abraded particles containing amorphous alpha-cellulose into the first of a plurality of treatment zones as a solids stream and feeding hot water and steam into the last of said treatment zones, as a liquid stream, and passing said solids stream and said liquid stream in countercurrent flow with respect to each other through said treatment zones at a temperature of 110°–127° C. and at a liquid-to-solids ratio of at least 7 to 1;

g. separating said particles from said aqueous solution emanating from each said treatment zone and passing the separated portions, respectively, in opposite directions to the next treatment zone; and

h. recovering from said first treatment zone an aqueous solution containing glucose and xylose, and recovering from said last treatment zone particles containing lignin and being substantially free of cellulose and mono-sugars.

4,427,585
1:2 CHROMIUM AND COBALT COMPLEX DYES

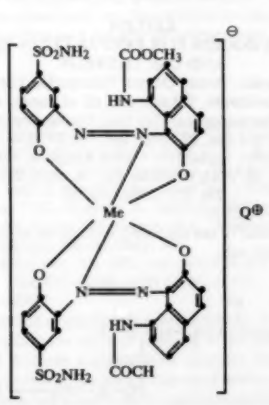
Fabio Beffa, Rieben, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Jul. 27, 1981, Ser. No. 287,020

Int. Cl.[3] **C07C** *107/108;* **C09B** *45/14*

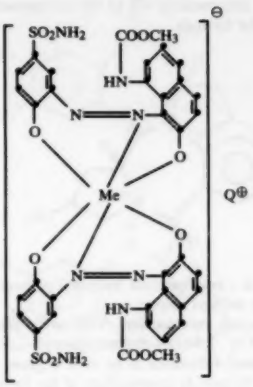
U.S. Cl. 260—151 **3 Claims**

1. A 1:2 metal complex dye of the formula I

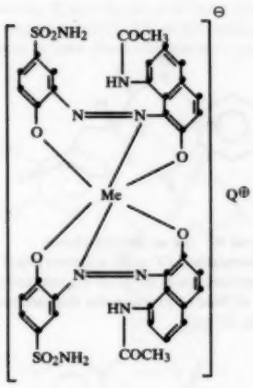


(I)

wherein Me is chromium or cobalt and $Q^{\oplus}$ is a sodium ammonium or triethanolamine cation, or a mixture thereof with the metal complex dyes of the formulae II and III



(II)



(III)

wherein Me and $Q^{\oplus}$ have the above meanings.

4,427,586

2-OXOAZETIDINE DERIVATIVES AND PRODUCTION THEREOF

Mitsuo Numata, Takatsuki; Masayoshi Yamaoka, Toyonaka; Tatsuo Nishimura, Ashiya, and Norichika Matsumoto, Neyagawa, all of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

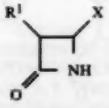
Filed Nov. 13, 1981, Ser. No. 321,325

Claims priority, application Japan, Nov. 13, 1980, PCT/JP80/281

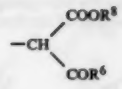
Int. Cl.³ C07D *205/08, 403/04, 487/04*

U.S. Cl. 260—239 A **9 Claims**

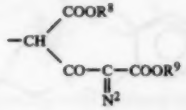
1. A compound of the formula:



wherein R^1 represents phthalimido, benzyloxycarbonylamino, halogen or straight-chain, branched or cyclic alkyl of one to eight carbon atoms which has a hydroxy substituent; X represents (1) a group of the formula,



wherein R^8 is a carboxyl-protecting group, and R^6 is lower alkyl of one to four carbon atoms, halogenomethyl, methylthiomethyl, phenylthiomethyl, naphthylthiomethyl, carboxymethyl whose carboxyl may be protected, lower alkoxy of one to four carbon atoms, halogeno lower alkoxy of one to four carbon atoms, benzyloxy, p-nitrobenzyloxy, o-nitrobenzyloxy, lower alkylthio of one to four carbon atoms, amino lower alkylthio of one to four carbon atoms whose amino group may be protected, or amino lower alkenylthio of two to four carbon atoms whose amino group may be protected; or (2) a group of the formula,



wherein R^8 and R^9 respectively represent a carboxyl-protecting group.

4,427,587

TOTAL SYNTHESIS OF ANTITUMOR ANTIBIOTICS BBM-2040A AND BBM-2040B

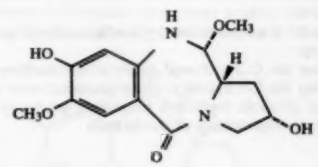
Takushi Kaneko, and Henry S. L. Wong, both of Fayetteville, N.Y., assignors to Bristol-Myers Company, New York, N.Y.

Filed Nov. 10, 1982, Ser. No. 440,779

Int. Cl.³ C07D *487/04*

U.S. Cl. 260—239.3 T **19 Claims**

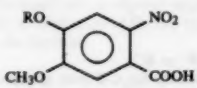
1. A process for the preparation of a compound of the formula



I

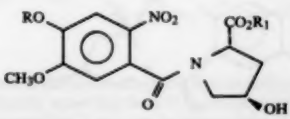
which comprises the steps of

(1) coupling a (lower)alkyl ester of trans-4-hydroxy-L-proline in an inert solvent with an acylating derivative of an acid of the formula



II

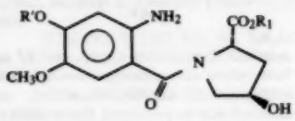
wherein R is a conventional phenolic hydroxyl protecting group to produce an intermediate of the formula



III

wherein R_1 is (lower)alkyl and R is as defined above;

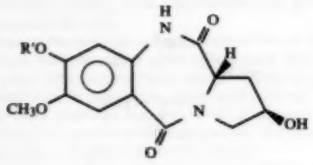
(2) selectively reducing the nitro group of intermediate III to produce an intermediate of the formula



IV

wherein R' is hydrogen or a conventional phenolic hydroxyl protecting group and R_1 is as defined above;

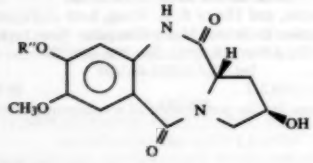
(3) cyclizing intermediate IV by heating in an inert solvent or by treatment with aqueous acid to produce an intermediate of the formula



V

wherein R' is as defined above;

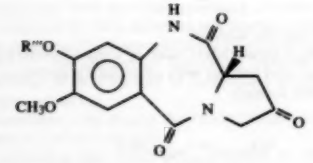
(4) in the case where R' in intermediate V is hydrogen, converting intermediate V to the corresponding intermediate of the formula



Va

wherein R'' is a conventional phenolic hydroxyl protecting group;

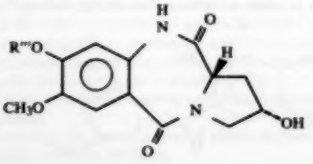
(5) oxidizing the C-2 hydroxyl group of intermediate V or Va having the C-8 hydroxyl group protected with a conventional phenolic hydroxyl protecting group so as to produce an intermediate of the formula



VI

wherein R''' is R' or R'';

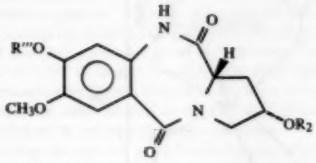
(6) selectively reducing the C-2 keto group of intermediate VI to produce the C-2 α-hydroxy isomer of the formula



VII

wherein R''' is as defined above;

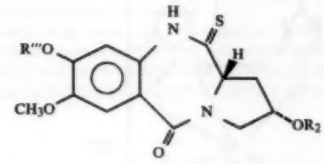
(7) converting intermediate VII to the corresponding intermediate of the formula



VIII

wherein R_2 is a conventional hydroxyl protecting group and R''' is as defined above;

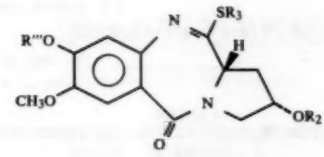
(8) reacting amide intermediate VIII with phosphorous pentasulfide or 2,4-bis(4-methoxyphenyl)-1,3-dithia-2,4-diphosphetane-2,4-disulfide in an inert organic solvent to produce the thioamide intermediate of the formula



IX

wherein R_2 and R''' are as defined above;

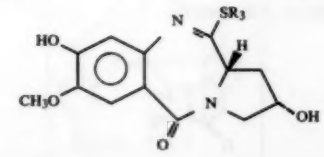
(9) reacting intermediate IX with a (lower)alkyl halide or (lower)alkoxonium salt in an inert organic solvent and in the presence of base to produce the thioiminoether intermediate of the formula



X

wherein R_3 is (lower)alkyl and R_2 and R''' are as defined above;

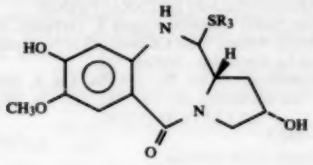
(10) optionally removing the C-2 and C-8 hydroxyl protecting groups of intermediate X to form an intermediate of the formula



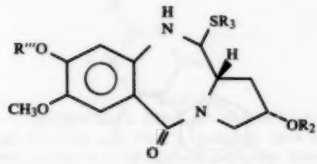
XI

wherein R_3 is as defined above;

(11) selectively reducing the thioiminoether moiety of intermediate XI or intermediate X in an inert solvent to produce a thiocarbinolamine intermediate of the formula

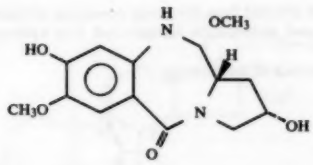

XII

or

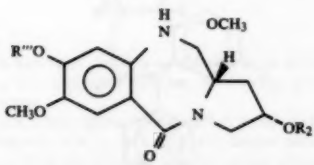

XII'

wherein R_3, R and R_2 are as defined above; and

(12) reacting intermediate XII or XII' with a mercuric salt in methanol to form the carbinolamine product of the formula


I

or


I'

wherein R_2 and R''' are as defined above; and, when the product obtained is compound I', removing the hydroxyl protecting groups R_2 and R''' from intermediate I' so as to form the desired deprotected product I.

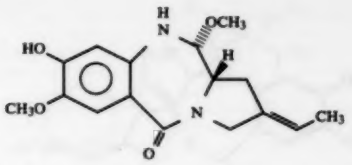
4,427,588

PROCESS FOR CONVERSION OF OXOTOMAYMYCIN TO TOMAYMYCIN

Takushi Kaneko, and Henry S. L. Wong, both of Fayetteville, N.Y., assignors to Bristol-Myers Company, New York, N.Y.

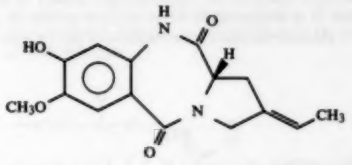
Filed Nov. 8, 1982, Ser. No. 439,965
Int. Cl.³ C07D 487/04
U.S. Cl. 260—239.3 T 18 Claims

1. A process for the preparation of a compound of the formula

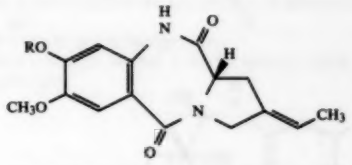

I

which comprises the steps of

(1) converting oxotomaymycin of the formula

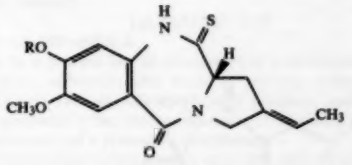

II

to the corresponding 8-OH protected intermediate of the formula


III

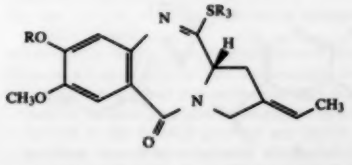
wherein R is a conventional phenolic hydroxyl protecting group;

(2) reacting amide intermediate III with phosphorous pentasulfide or 2,4-bis(4-methoxyphenyl)-1,3-dithia-2,4-diphosphetane-2,4-disulfide in an inert organic solvent to produce the thioamide intermediate of the formula


IV

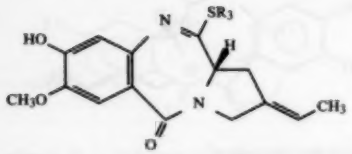
wherein R is as defined above;

(3) reacting intermediate IV with a (lower)alkyl halide or (lower)alkoxonium salt in an inert organic solvent and in the presence of base to produce the thioiminoether intermediate of the formula


V

wherein R_3 is (lower)alkyl and R is as defined above;

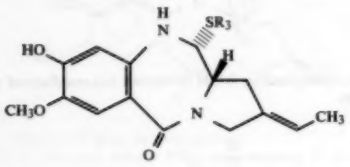
(4) optionally removing the C-8 hydroxyl protecting group of intermediate V to form an intermediate of the formula



VI

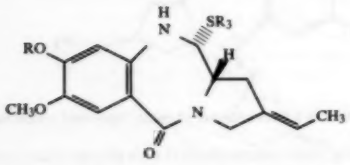
wherein R_3 is as defined above;

(5) selectively reducing the thioiminoether moiety of intermediate V or intermediate VI in an inert solvent to produce a thiocarbinolamine intermediate of the formula



VII

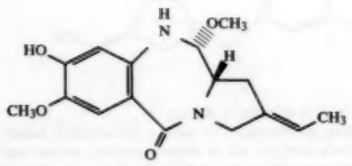
or



VIII

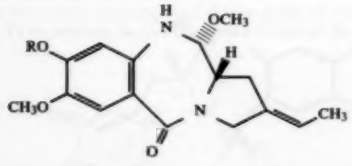
wherein R and R_3 are as defined above; and

(6) reacting intermediate VII or VIII with a mercuric salt in methanol to form the carbinolamine product of the formula



I

or



IX

wherein R is as defined above; and, when the product obtained is compound IX, removing the hydroxyl protecting group R from intermediate IX so as to form the desired tomaymycin product I.

4,427,589

PYRIMIDO[4,5-d][2]BENZAZEPINES

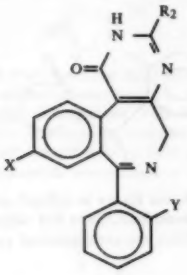
Rodney I. Fryer, North Caldwell; Eugene J. Trybulski, Parsippany, and Armin Walser, West Caldwell, all of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Continuation-in-part of Ser. No. 175,554, Aug. 5, 1980, abandoned. This application Jul. 23, 1981, Ser. No. 286,123

Int. Cl.[3] C07D *487/04*

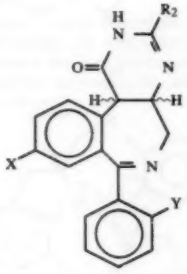
U.S. Cl. 260—243.3 5 Claims

1. A compound of the formula



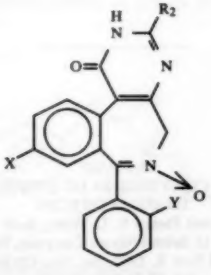
wherein R_2 is selected from the group consisting of hydrogen, lower alkyl and amino, X is halogen and Y is hydrogen or halogen.

2. A compound of the formula



wherein R_2 is selected from the group consisting of hydrogen, lower alkyl and amino; X is halogen and Y is hydrogen or halogen.

3. A compound of the formula



wherein R_2 is selected from the group consisting of hydrogen, lower alkyl and amino; X is halogen and Y is hydrogen or halogen.

4,427,590

TRIAZOLOBENZODIAZEPINE DERIVATIVES

Hans Allgeier, Haagen, Fed. Rep. of Germany, and Andre Gagneux, Basel, Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Nov. 17, 1971, Ser. No. 199,770

Claims priority, application Switzerland, Nov. 23, 1980, 17352/70

Int. Cl.³ A61K *31/55*; C07D *487/04*

U.S. Cl. 260—245.5 1 Claim

1. The compound which is 6-phenyl-8-chloro-4H-s-triazolo[4,3-a][1,4]benzodiazepine-1-methanol.

4,427,591

REDUCED A RING-$\Delta^{9(11)}$-CORTICOIDS

Donald E. Ayer, and Carl A. Schlagel, both of Kalamazoo, Mich., assignors to The Upjohn Company, Kalamazoo, Mich.

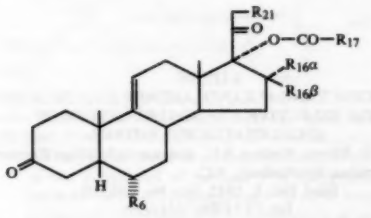
Division of Ser. No. 117,401, Mar. 31, 1980, Pat. No. 4,318,853. This application Sep. 3, 1981, Ser. No. 298,985

Int. Cl.³ C07J *7/00*

U.S. Cl. 260—397.45 60 Claims

1. A 5β-$\Delta^{9(11)}$-steroid of the formula:

(III')



where

R_6 is hydrogen, fluorine or chlorine atom or methyl group;

$R_{16\alpha}$ is a hydrogen, fluorine or chlorine atom or methyl group;

$R_{16\beta}$ is a hydrogen atom or methyl group with the proviso that one of $R_{16\alpha}$ or $R_{16\beta}$ is a hydrogen atom;

R_{17} is alkyl of 1 through 6 carbon atoms, phenyl, p-methylphenyl, p-carboxyphenyl or p-carboalkoxyphenyl;

R_{21} is a hydrogen, fluorine, chlorine or bromine atom or a $—OR_{21a}$ or $—OSO_2CH_3$ group;

R_{21a} is a hydrogen atom, $—COR_{21b}$ or $—PO(OH)_2$ and pharmaceutically acceptable salts thereof;

R_{21b} is alkyl of 1 thru 6 carbon atoms, phenyl, p-methylphenyl, or p-carboxyphenyl, p-carboalkoxyphenyl, $—CH_2CH_2COOH$ and pharmaceutically acceptable salts thereof; and

~ indicates the attached group can be in either the α or β configuration.

4,427,592

ANDROSTENE-17-DITHIOKETALS

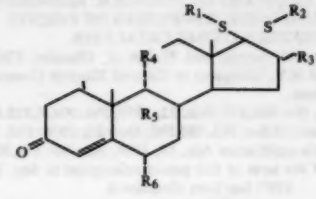
Ravi K. Varma, Belle Mead, and Donald S. Karanewsky, East Windsor, both of N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed Apr. 7, 1983, Ser. No. 462,164

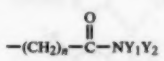
Int. Cl.³ C07J *1/00*

U.S. Cl. 260—397.45 23 Claims

1. A steroid having the formula



or a 1,2-dehydro, or 6,7-dehydro derivatives thereof, wherein one of R_1 and R_2 is alkyl, aryl, arylalkyl, or cycloalkyl, and the other is alkenyl, substituted alkenyl, alkynyl, substituted alkynyl, mono-, di- or trifluoroalkyl, cyanoalkyl, alkanoylalkyl or



wherein n is 1, 2, 3 or 4 and Y_1 and Y_2 are the same or different and each is hydrogen or alkyl;

R_3 is hydrogen, hydroxy, alkoxy, aryloxy, oxo, methylene, alkylthio, arylthio, alkanoyl, alkanoyloxy, or fluorine;

R_4 is carbonyl, β-hydroxymethylene or β-acetyloxymethylene;

R_5 is hydrogen or halogen; and

R_6 is hydrogen, methyl, hydroxy, alkanoyl, alkanoyloxy or halogen.

4,427,593

PROCESS FOR THE PRODUCTION OF PREDOMINANTLY LINEAR ALIPHATIC CARBOXYLIC ACID ESTERS

Peter Hofmann, and Wolfgang H. E. Müller, both of Marl, Fed. Rep. of Germany, assignors to Chemische Werke Hüls AG, Marl, Fed. Rep. of Germany

Filed Aug. 11, 1981, Ser. No. 291,915

Claims priority, application Fed. Rep. of Germany, Sep. 12, 1980, 3034422

Int. Cl.³ C11C *3/02*

U.S. Cl. 260—410.9 R 3 Claims

1. In a process for the production of predominantly linear aliphatic carboxylic acid esters by reacting olefins, carbon monoxide and alkanols at elevated pressures and elevated temperatures in the presence of a catalyst consisting of a cobalt compound and a promoter, comprising:

(A) reacting olefins, carbon monoxide and alkanols in the presence of a catalyst consisting of a cobalt compound and pyridine, a non-ortho-substituted alkylpyridine or a mixture thereof at elevated pressures and elevated temperatures to form a reaction mixture;

(B) separating said reaction mixture into the following fractions:

(a) esters formed as a reaction product;

(b) said pyridine, non-ortho-substituted alkylpyridine, or mixture thereof;

(c) unreacted olefins, carbon monoxide and alkanols; and

(d) a cobalt sump product; the improvement comprising

(e) separating a cobalt free mixture of high boiling point substances having a higher boiling point than said esters formed as the reaction product and higher than said pyridine, non-ortho-substituted alkylpyridine or mixtures thereof used as the catalytic component; and

(C) using said cobalt free mixture of high boiling point substances as promotor in said process for the production of predominantly linear aliphatic carboxylic acid esters.

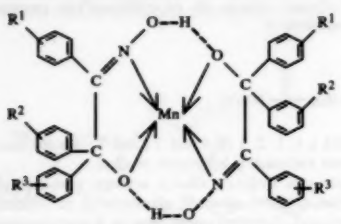
4,427,594

OXIDATIVE COUPLING OF PHENOLIC MONOMERS WITH MANGANESE COMPLEXES OF PHENYL BENZOIN OXIME CATALYSTS

Eugene G. Banucci, Scotia, and Walter K. Olander, Clifton Park, both of N.Y., assignors to General Electric Company, Pittsfield, Mass.

Division of Ser. No. 880,136, Feb. 22, 1978, Pat. No. 4,225,528, which is a division of Ser. No. 753,507, Dec. 21, 1976, Pat. No. 4,093,598. This application Apr. 18, 1980, Ser. No. 141,882
The portion of the term of this patent subsequent to Sep. 30, 1997, has been disclaimed.
Int. Cl.³ C07F 13/00
U.S. Cl. 260—429 C 7 Claims

1. A manganese complex of the formula:



(I)

wherein R^1, R^2 and R^3 are independently selected from the group consisting of hydrogen, lower alkyl of 1 to 8 carbon atoms, lower alkenyl of from 1 to 8 carbon atoms, aryl, amino, lower alkoxy of from 1 to 8 carbon atoms and halogen.

4,427,595

CATALYST COMPOSITION TO EFFECT METATHESIS OF ACETYLENES

Richard R. Schrock, Brighton, Mass., assignor to Massachusetts Institute of Technology, Cambridge, Mass.

Filed Jul. 16, 1981, Ser. No. 283,752
Int. Cl.³ C07F 11/00
U.S. Cl. 260—429 R 10 Claims

1. A compound of the formula

$$[L_yX_{n+3}W{=}CR^3]^{n-}(M^+)^n$$

wherein

R^3 is an alkyl or aryl;

L is a moiety of the formula $ZR^4R^5R^6$ wherein Z is selected from the group consisting of nitrogen and phosphorous and R^4, R^5 and

R^6 can be the same or different and are alkyl, aralkyl or aryl;

L is a moiety of the formula $OZR^4R^5R^6$, $ZR^4R^5R^6$, $ZR^4R^5(OR^6)$,

$ZR^4(OR^5)(OR^6)$ or $Z(OR^4)(OR^5)(OR^6)$;

X is F, Cl, Br, I, OR^4, NR^4R^5 or SR^4;

M^+ is selected from the group consisting of $[NR^3R^4R^5R^6]^+$, $[PR^3R^4R^5R^6]^+$, Li^+, K^+ or Na^+;

alkyl has 1–10 carbons, aralkyl has 7–10 carbons and aryl has 6–10 carbons;

n is 0 or 1;

y is 0, 1 or 2;

with the proviso that

y is 0 when X is OR^4, NR^4R^5 or SR^4, and n=0;

y is 0 when X is OR^4, F, Cl, Br or I, and n=1.

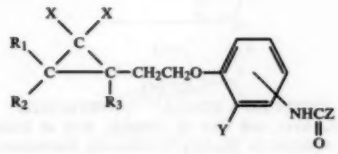
4,427,596

N-[2-(CYCLOPROPYL) ETHOXY] PHENYLANILIDE DERIVATIVES, AND THEIR PRODUCTION AND USE

Ichiki Takemoto, Hyogo; Katsuzo Kamoshita, Osaka; Ryo Yoshida, Kawanishi, and Seizo Sumida, Hyogo, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Filed Mar. 13, 1981, Ser. No. 243,631
Claims priority, application Japan, Mar. 27, 1980, 55/39753
Int. Cl.³ C07C 131/105
U.S. Cl. 260—453 RW 5 Claims

1. A compound of the formula:



wherein R_1, R_2 and R_3, which may be same or different, are each hydrogen or C_1–C_4 alkyl, X is chlorine or bromine, Y is hydrogen, chlorine, bromine, fluorine or iodine and Z is N-methoxy-N-methylamino.

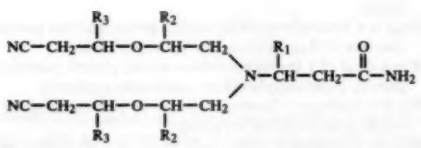
4,427,597

AMIDODICYANOALKANOLAMINES AND PROCESS FOR SELECTIVE CYANOALKYLATION OF AMIDODIALKANOLAMINES

Edward W. Kluger, Pauline, S.C., assignor to Milliken Research Corporation, Spartanburg, S.C.

Filed Feb. 8, 1982, Ser. No. 346,788
Int. Cl.³ C07C 121/417
U.S. Cl. 260—465.4 2 Claims

1. Nitrile-containing compounds having the following formula:



wherein R_1, R_2 and R_3 are each independently selected from H or a lower alkyl group having from 1 to about 6 carbon atoms.

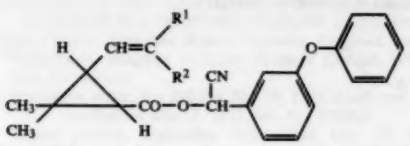
4,427,598

PROCESS FOR PREPARING CYCLOPROPANE CARBOXYLIC ACID ESTER DERIVATIVES

Ronald F. Mason, and Derek A. Wood, both of Kent, England, assignors to Shell Internationale Research Maatschappij B. V., Netherlands

Filed Apr. 10, 1981, Ser. No. 252,891
Claims priority, application United Kingdom, Apr. 23, 1980, 8013308
Int. Cl.³ C07C 121/75
U.S. Cl. 260—465 D 14 Claims

1. A process for preparing a 1:1 mixture of 1R cis S-isomers and 1S cis R-isomers substantially free of 1S cis S-isomers and 1R cis R-isomers of a compound of formula



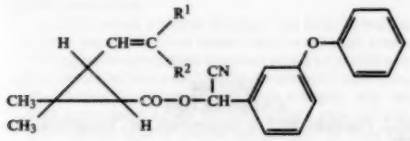
(I)

wherein R^1 and R^2 are selected from the group consisting of chlorine, bromine and methyl, which process comprises:

dissolving a mixture of 1S cis S-isomers and 1R cis R-isomers of the compound of formula I, in an organic amine base containing from 5 to 7 carbon atoms and is a secondary amine containing two branched alkyl groups or a tertiary amine; and

crystallizing out from the resulting solution of cis-isomers of formula I in the organic amine base a 1:1 mixture of the 1R cis S-isomers and 1S cis R-isomers substantially free of 1S cis S-isomers and 1R cis R-isomers.

14. A process for preparing a 1:1 mixture of 1R cis S-isomers and 1S cis R-isomers of a compound of formula



(I)

wherein R^1 and R^2 are selected from the group consisting of chlorine, bromine and methyl, which process comprises:

dissolving a mixture of 1S cis S-isomers and 1R cis R-isomers of the compound of formula I in triethylamine in the presence of 1R cis S-isomers and 1S cis R-isomers of the compound of formula I at a temperature of about 60° to about 70° C.;

said triethylamine containing less than about 0.5 percent water by weight; and

crystallizing out from the resulting solution of cis-isomers of formula I in the triethylamine at a temperature of about 0° to about 20° C. a 1:1 mixture of the 1R cis S-isomers and 1S cis R-isomers substantially free of 1S cis S-isomers and 1R cis R-isomers.

4,427,599

METHOD FOR PREPARATION OF N-PHOSPHONOMETHYLGLYCINE

Raymond A. Felix, Richmond, Calif., assignor to Stauffer Chemical Company, Westport, Conn.

Continuation-in-part of Ser. No. 391,033, Jun. 22, 1982, abandoned. This application Feb. 14, 1983, Ser. No. 465,931

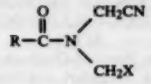
Int. Cl.³ C07F *9/38*

U.S. Cl. 260—502.5 F **9 Claims**

1. A method of preparing N-phosphonomethylglycine comprising

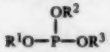
(a) reacting 1,3,5-tricyanomethylhexahydro-1,3,5-triazine with an acyl chloride of the formula

wherein X is chlorine, bromine or iodine and R is an aliphatic or aromatic group to form the N-cyanomethyl-N-chloromethyl amide of the acyl chloride which has the structural formula

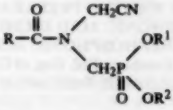


wherein X and R are as defined above;

(b) reacting the amide formed in step (a) with a phosphite of the formula



wherein R^1 and R^2 are both aromatic groups or both aliphatic groups, and R^3 is an aliphatic group or R^3 is an alkali metal, to form a phosphonate compound of the formula



wherein R^1 and R^2 are as defined; and

(c) hydrolyzing the phosphonate formed in step (b) to yield N-phosphonomethylglycine.

4,427,600

PREPARATION OF 1-ALKYL-2-CHLORO-5-NITROBENZENE-4-SULFONIC ACIDS

Peter Tonne, Neustadt; Elisabeth R. Mueller, Bobenheim-Roxheim, and Helmut Goerth, Ludwigshafen, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

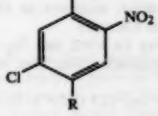
Filed Jan. 29, 1982, Ser. No. 343,933

Claims priority, application Fed. Rep. of Germany, Feb. 7, 1981, 3104388

Int. Cl.³ C07C *143/24*

U.S. Cl. 260—505 E **3 Claims**

1. A process for the preparation of a 1-alkyl-2-chloro-5-nitro-benzene-4-sulfonic acid of the formula



where R is alkyl, by sequential sulfonation, chlorinatiion and nitration starting from an alkylbenzene, wherein the alkylbenzene is sulfonated at temperatures between about 100° to 130° C. with from 2.5 to 3 moles of concentrated sulfuric acid per mole of alkylbenzene, the reaction product is then reacted at temperatures between about 60° to 80° C. with from about 1.1 to 1.3 moles of chlorine in the absence of a catalyst, the product is subsequently nitrated with highly concentrated nitric acid at elevated temperatures, and the resulting compound of said formula is isolated.

4,427,601

PROCESS FOR PREPARING 1-AMINO-2-NAPHTHOL-4-SULPHONIC ACID (AMIDOL ACID)

Erich Hammerschmidt, Bergisch-Gladbach; Horst Behre, Odenthal; Heinz U. Blank, Odenthal, and Otto Lindner, Bergisch-Gladbach, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Nov. 5, 1982, Ser. No. 439,474

Claims priority, application Fed. Rep. of Germany, Nov. 27, 1981, 3147152

Int. Cl.³ C07C *143/66*

U.S. Cl. 260—509 10 Claims

1. In a process for preparing 1-amino-2-naphthol-4-sulphonic acid by acidifying 3-oxo-4-hydroxyimino-1,2,3,4-tetrahydronaphthalene-1-sulphonic acid or its alkali metal salt in the presence of hydrogen sulphite, the improvement which comprises carrying out the process in the presence of iron ions.

4,427,602

PROCESS FOR THE PREPARATION OF VINYLPHOSPHONIC ACID DICHLORIDE AND 2-CHLOROETHANEPHOSPHONIC ACID DICHLORIDE

Hans-Jerg Kleiner, Kronberg, Fed. Rep. of Germany, assignor to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

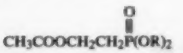
Filed Mar. 18, 1982, Ser. No. 359,235

Claims priority, application Fed. Rep. of Germany, Mar. 20, 1981, 3110976

Int. Cl.³ C07F *9/42*

U.S. Cl. 260—543 P 4 Claims

1. A process for the preparation of vinylphosphonic acid dichloride and 2-chloroethanephosphonic acid dichloride which comprises heating a 2-acetoxyethanephosphonic acid dialkyl ester of the general formula



$$CH_3COOCH_2CH_2P(OR)_2$$

ps in which R is alkyl of from 1 to 4 carbon atoms, in the presence of an acid or basic catalyst at temperature of from 150° to 270° C. with elimination of an alkyl acetate, reacting the resulting reaction mixture with water at a temperature of from 130° to 230° C. while simultaneously distilling off the alcohol formed, and reacting the crude vinylphosphonic acid thus formed with phosgene in the presence of a catalyst and also in the presence of a phosphonic acid dichloride.

4,427,603

PROCESS FOR MAKING PHOSPHONIC ACID ESTER CHLORIDES

Jürgen Grosse, Hürth, and Werner Pieper, Erftstadt, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

Filed May 18, 1982, Ser. No. 379,304

Claims priority, application Fed. Rep. of Germany, May 20, 1981, 3120069

Int. Cl.³ C07F *9/14*

U.S. Cl. 260—969 7 Claims

1. A process for making phosphonic acid ester chlorides of the general formula (I)

(I)

in which R stands for an alkyl group with 1 to 6 carbon atoms or an aryl group and R′ stands for an alkyl group with 1 to 20 carbon atoms or an aryl group, which comprises: reacting a compound of general formula (II)

(II)

with a sulfuric acid monoester of general formula (III)

$$R'—O—SO_3H \quad (III)$$

R and R′ in formulae (II) and (III) respectively, having the meanings given above, the reactants being used in about equimolar proportions and the reaction being effected at a temperature of from −20° C. to 50° C.; terminating the reaction and separating the phosphonic acid ester chloride from the reaction mixture by subjecting this latter to distillation under vacuum.

4,427,604

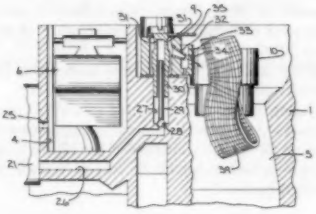
CARBURETOR

Donald J. Pawelski, 5971 S. Honeycreek Dr., Greenfield, Wis. 53221

Filed Feb. 22, 1982, Ser. No. 351,016

Int. Cl.³ F02M *29/04*

U.S. Cl. 261—23 A 10 Claims



1. A carburetor for an internal combustion engine, comprising:

a body defining an air-fuel mixing chamber and having an air inlet and having an outlet to discharge an air-fuel mixture to the engine,

a venturi disposed within said chamber, and having an inlet end and an outlet end,

first fuel supply means responsive to operation of the engine for supplying liquid fuel to said venturi,

an absorbent member disposed within said chamber adjacent said inlet and composed of a material capable of absorbing said liquid fuel, said absorbent member extending alongside said venturi and terminating beyond the outlet of said venturi,

a fuel jet in the chamber and disposed in direct alignment with said absorbent member,

second fuel supply means for supplying liquid fuel to said jet, said fuel being discharged from said jet into contact with said absorbent member and being absorbed in said material, and

operating means for operating said second fuel supply means to supply fuel through said jet.

4,427,605

TRAY DEVICE FOR COLLECTING AND DISTRIBUTING LIQUID FOR A COUNTER-CURRENT COLUMN

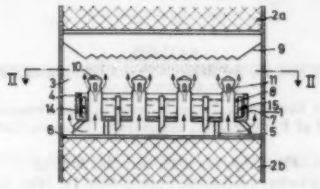
Werner Meier, Elgg, and Robert Hunkeler, Dielsdorf, both of Switzerland, assignors to Sulzer Brothers Limited, Winterthur, Switzerland

Continuation of Ser. No. 188,586, Sep. 18, 1980, abandoned. This application Mar. 8, 1982, Ser. No. 355,328

Claims priority, application Switzerland, Oct. 25, 1979, 9566/79

Int. Cl.³ B01F 3/04

U.S. Cl. 261—97 2 Claims



1. In combination,

a counter-current column having a peripheral wall and at least a pair of discrete spaced apart exchange zones containing packings therein disposed along a vertical axis; and

a tray device between said exchange zones for collecting and distributing liquid separately from a vapor, said tray device comprising a base having an edge zone spaced from said column wall to permit rising vapor to flow therebetween, a plurality of upstanding chimneys distributed over said base for distribution of the rising vapor, each said chimney having a covering at a top end to prevent entry of liquid therein and at least one vapor outlet above said base for passage of vapor rising upwardly through said respective chimneys separately from the descending liquid, and a plurality of tubes disposed in and extending through said base between said chimneys for uniformly distributing liquid into an exchange zone therebelow, each said tube having at least one liquid inlet below said vapor outlets in said chimneys and above said base for passage of liquid downwardly through said respective tube and a plurality of said tubes adjacent said edge zone of said base having outwardly and downwardly bent lower portions directed towards said column wall.

4,427,606

VAPOR-LIQUID CONTACT GRID

Gilbert K. Chen; Paul M. Nyberg, and Matthew Buchholz, all of Wichita, Kans., assignors to Koch Engineering Company, Inc., Wichita, Kans.

Division of Ser. No. 184,141, Sep. 4, 1980, Pat. No. 4,356,611, which is a division of Ser. No. 95,256, Nov. 19, 1979, Pat. No. 4,276,242. This application Sep. 22, 1982, Ser. No. 421,055

The portion of the term of this patent subsequent to Jun. 30, 1998, has been disclaimed.

Int. Cl.³ B01D 3/22; B32B 3/10

U.S. Cl. 261—111 10 Claims

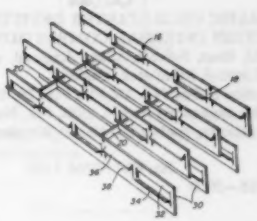
1. A vapor-liquid contact grid apparatus which comprises:

(a) a plurality of grid members positioned in a generally upright and generally parallel, spaced-apart relationship defining a vapor passageway between the upright grid members,

(i) the grid members composed of a thin, upright grid element,

(ii) vanes derived from the grid members and extending transversely outwardly into the vapor passageway from the upright grid members, and

(iii) vanes being paired into a plurality of longitudinally spaced sections, so that the vanes of each section are positioned one above the other along the longitudinal length of the grid members, at least one vane of each pair extending outwardly from one side and at least one vane of each pair extending outwardly from the other side to define an opening therebetween, and the vanes of each section separated longitudinally from each adjacent section by upright rib elements of the grid members, the vanes generally of a significantly greater longitudinal length of the grid members than the rib elements therebetween;



(b) a plurality of connectors composed of thin, upright strip elements extending between the grid members, the connectors positioned in a generally spaced-apart and parallel relationship; and

(c) means to secure the connectors to the grid members at the rib elements, to form at least one layer of a vapor-liquid grid composed of grid members and connectors in a fixed, spaced-apart relationship.

4,427,607

DEVICE IN AN EVAPORATIVE COOLER

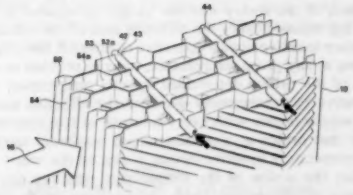
Lars E. R. Korsell, Stockholm, Sweden, assignor to Aktiebolaget Carl Munters, Solluntuna, Sweden

Division of Ser. No. 114,199, Jan. 22, 1980, Pat. No. 4,337,216, which is a continuation of Ser. No. 944,248, Sep. 21, 1978, abandoned. This application Jun. 7, 1982, Ser. No. 385,791

Claims priority, application Sweden, Sep. 22, 1977, 7710655

Int. Cl.³ B01F 3/04

U.S. Cl. 261—112 8 Claims



1. A contact body for use in an evaporative cooler adapted to supply liquid to only selected portions of the contact body, comprising water supply means, a plurality of adjacent layers having corrugations formed therein inclined to the vertical with the corrugations in each layer crossing the corrugations on adjacent layers and defining fluid flow channels therebetween, said layers including longitudinally extending top and bottom edges, said top edges of said layers being relatively flat and bent in a predetermined pattern transversely of the longitudinal direction to define outwardly widened portions relative to the rest of the layer, said widened portions being located to correspond with and be adjacent to the widened portions of adjacent layers to define two groups of elongated openings at the top of the contact body with the openings in each group respectively communicating with alternate fluid flow channels

within the contact body thereby to define two groups of channels in the contact body whereby liquid may be supplied to the contact body through only one group of openings to one group of channels; said water supply means comprises pipes that extend transversely to the longitudinally extending top edges of the layers and are imbedded in recesses formed in the upper edges of the layers and have distribution apertures formed therein at their underside to permit the flow of liquid therethrough and into said one group of channels.

4,427,608

AUTOMATIC COLD STARTER DEVICES FOR SPARK IGNITION INTERNAL COMBUSTION ENGINES

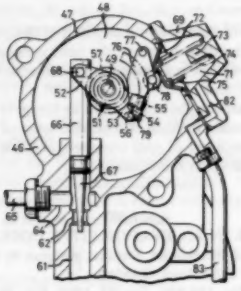
Gray E. D. Ross, Newton Abbot, England, assignor to Solex (U.K.) Limited, Middlesex, England

Continuation of Ser. No. 236,548, Feb. 20, 1981, abandoned. This application Aug. 4, 1982, Ser. No. 405,046

Claims priority, application United Kingdom, Feb. 22, 1980, 8006091

Int. Cl.³ F02M *1/06*

U.S. Cl. 261—39 D **12 Claims**



1. In a spark ignition internal combustion engine fitted with a carburetor having a driver operable throttle valve, an automatic cold start fuel supply device comprising a casing, a fuel supply orifice formed within the casing and through which fuel is adapted to be drawn by the mixing chamber depression, means for varying the effective area of the fuel supply orifice, a rotary member coupled to the area varying means so that rotation of the rotary member causes movement of the area varying means to vary the effective area of the orifice, a temperature sensitive device operative to position the area varying means, at any given temperature, so as to provide an effective area of the orifice determined by that temperature and also operative to continuously decrease the effective area of the fuel supply orifice with every increase of temperature and to close that orifice at a predetermined maximum temperature, the temperature sensitive device acting on the rotary member so that the action of the temperature sensitive device with increase of temperature tends to rotate the rotary member in the direction to reduce the effective area of the orifice, spring means provided to urge said area varying means towards a position in which the effective area of the fuel supply orifice is a maximum, the load exerted by the spring means being transmitted to the area varying means by rotation of the rotary member, and means actuable by the engine, when that engine commences to run under its own power, to remove the load of the spring means from the rotary member so that said area varying means take up a position determined by the temperature sensitive device and are free to move to reduce the effective area of the fuel supply orifice under the control of the temperature sensitive device as the temperature increases up to said predetermined maximum temperature, means to replace said load of the spring to increase the effective area of said fuel supply orifice when the engine is accelerated while operating at a temperature below said predetermined maximum temperature, rigid load reacting means, which do not require the use of separate thermostatic means, mounted in the casing and which react any load exerted on the rotary member by the action of the spring means only when the temperature of the engine is at or above said predetermined temperature so that the rotary member is not rotated by the action of the spring means from the position in which it is located by the temperature sensitive device when the temperature of the engine is at or above said predetermined temperature, said rigid load reacting means allowing the effect of the spring means to vary the effective area of the fuel supply orifice when the engine is operating at a temperature below said predetermined maximum temperature.

4,427,609

PROCESS FOR PRODUCING PIEZOELECTRIC POLYMER FILMS

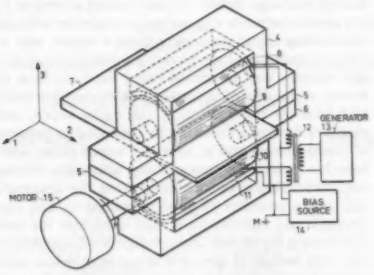
Dominique Broussoux; Hugues Facoetti, and Francois Micheron, all of Paris, France, assignors to Thomson-CSF, Paris, France

Filed Sep. 16, 1981, Ser. No. 302,782

Claims priority, application France, Sep. 19, 1980, 80 20213

Int. Cl.³ B29D *7/24*; H01G *7/02*

U.S. Cl. 264—22 **14 Claims**



1. A process for the production of a piezoelectric polymer film by mechanical stretching and electrical polarization, comprising forming a wafer shaped polymer material blank in the α phase, whose thickness exceeds that of the film and reducing the thickness of this blank solely by a rolling operation between a pair of rollers defining between them a crushing area under an electric field applied across the thickness of the film in the crushing area and at a speed sufficiently slow to produce the said mechanical stretching and simultaneously the said electrical polarization.

4,427,610

METHOD AND APPARATUS FOR CURING CONCRETE PRODUCTS

John A. Murray, Norristown, Pa., assignor to Conger/Murray Systems, Inc., Palm Beach, Fla.

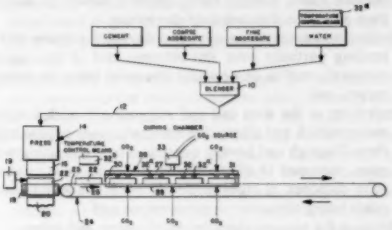
Filed Jan. 6, 1982, Ser. No. 337,428

Int. Cl.³ C04B *15/14*; B28B *3/04, 7/10, 17/02*

U.S. Cl. 264—82 **13 Claims**

1. In a method of rapidly manufacturing concrete or like products having an advanced state of cure by blending together a calcareous cementitious binder, aggregate, and water to form a mix, molding the mixture to have a predetermined shape and exposing the molded product to an atmosphere in a chamber consisting of at least 95%, excluding water vapor, carbon dioxide gas, the improvement which comprises feeding carbon dioxide gas at a temperature in the range of about 0° to −70° F. to said chamber during the movement of the molded

product therein, continuing the feed so as to cause an exothermic temperature rise in the molded product and exposing the molded product to the carbon dioxide gas for no more than 5 minutes.



4,427,611
PROCESS FOR PREPARING CALCIUM SILICATE SHAPED PRODUCT

Yasuo Oguri, Tokyo; Mitsuru Awata, Kodaira; Junji Saito, Machida; Soichi Inoue, Kawasaki; Tatsuo Andio, and Mitsunobu Abe, both of Yokohama, all of Japan, assignors to Mitsubishi Chemical Industries Ltd., Tokyo, Japan

Continuation of Ser. No. 227,697, Jan. 23, 1981, abandoned. This application Oct. 13, 1982, Ser. No. 433,995

Claims priority, application Japan, Feb. 4, 1980, 55-12161

Int. Cl.³ C04B 7/34

U.S. Cl. 264—86 20 Claims

1. A process for producing a shaped calcium silicate product, comprising:

(a) forming an aqueous slurry of calcium silicate hydrate obtained by heating and reacting a calcareous source with a siliceous source in water as a dispersion;

(b) molding said aqueous slurry into a shaped object;

(c) heat treating said molded product under the conditions specified by the relationships (I) and (II):

$$100 \leqq \theta \cdot T \quad \text{(I)}$$

$$50 \leqq \theta \leqq 300 \quad \text{(II)}$$

wherein θ represents the temperature (°C.) of the interior of said molded product and T represents the time (hrs), with the proviso that the amount of water loss during said heat treatment is less than 25 wt.%;

(d) optionally steam curing said treated product; and

(e) drying the cured product.

4,427,612
METHOD FOR SEALING AN ELECTRICAL COMPONENT, PARTICULARLY A RELAY

Cornelia Albert, Krailling, and Ulf Rauterberg, Munich, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

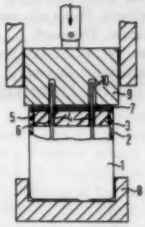
Filed Dec. 29, 1981, Ser. No. 335,585

Claims priority, application Fed. Rep. of Germany, Feb. 20, 1981, 3106371

Int. Cl.³ B29C 3/00

U.S. Cl. 264—154 9 Claims

8. A method for sealing an electrical component having a housing with an end-side surface to be sealed, comprising the steps of: providing a tissue-like un-impregnated fleece layer having high capillary absorption capacity and dimensioned for said end-side surface being sealed; applying a solvent at said end-side surface which attacks a material of the housing and uniformly pressing the fleece layer onto said end-side surface with a stamp surface-wise and dimensionally matched to said end-side surface, a temperature of the stamp being selected depending upon a type of fleece material being used such that the fleece layer lies in a planar fashion on said end-side surface, is smoothened, and adheres at all locations of said end-side surface; and impregnating the fleece layer with a low-viscosity age-hardenable casting resin.



4,427,613
CONTINUOUS PROCESS FOR THE PRODUCTION OF FILAMENTS OR FIBERS FROM DIFFICULTLY SOLUBLE SYNTHETIC POLYMERS

Ulrich Reinehr; Joachim Dross; Toni Herbertz, all of Dormagen; Hermann-Josef Jungverdorben, Grevenbroich, and Hans K. Burghartz, Neuss, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Continuation of Ser. No. 110,165, Jan. 7, 1980, abandoned. This application Jul. 2, 1981, Ser. No. 279,898

Claims priority, application Fed. Rep. of Germany, Jan. 18, 1979, 2901860

Int. Cl.³ D02G 3/00

U.S. Cl. 264—206 6 Claims

1. A process for the continuous production of synthetic non-discolored filaments and fibers from an acrylonitrile homopolymer which comprises preparing a suspension consisting essentially of said polymer in dimethyl formamide at room temperature and subsequently heating the suspension thus formed for at least 3 minutes to at least 130° C., and filtering the clear spinning solution formed without intermediate cooling, homogenizing said solution by means of a static mixer and spinning it immediately afterwards into filaments having K-values of at least 90.

4,427,614
3-HYDROXYBUTYRIC ACID POLYMERS

Peter J. Barham, Bristol, and Paul A. Holmes, Middlesbrough, both of England, assignors to Imperial Chemical Industries PLC, London, England

Filed Oct. 14, 1982, Ser. No. 434,229

Claims priority, application United Kingdom, Oct. 29, 1981, 8132681; Mar. 24, 1982, 8208577

Int. Cl.³ D01D 5/12

U.S. Cl. 264—210.1 12 Claims

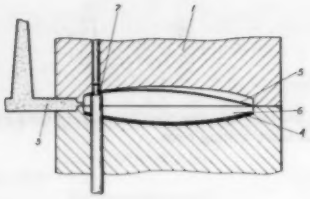
1. A process for the production of a shaped article from a polymeric material in which 3-hydroxybutyric acid residues form at least 40 mole % of the polymer chain comprising subjecting a solvent-free preform of the polymer to compressive force at a temperature between the glass transition temperature and the crystalline melting point of the polymer so that its thickness is reduced by at least 5%, and thereafter drawing the compressed preform uni- or bi-axially.

4,427,615

METHOD OF MAKING INJECTION MOULDED PLASTIC OBJECTS WITH IMBEDDED DECORATIVE AND/OR DESCRIPTIVE PRINTS

Peder C. Eskesen, Holbaek, Denmark, assignor to Brdr. Eskesen Aktieselskab, Roedovre, Denmark

Filed Nov. 24, 1981, Ser. No. 324,501
Claims priority, application Denmark, Dec. 9, 1980, 5250/80
Int. Cl.³ B29C *11/00*; B29D *3/00*
U.S. Cl. 264—261 **3 Claims**



1. A method of manufacturing of an article covered by a foil embeded in an outside surface of said article, and having an aperture going there through, by an injection of a moulded material in a mould, which comprises:

(a) placing foils in two halves of the mould;

(b) inserting a pin inside of said mould in such manner that said pin will go through the foil located in one half of the mould and will support the foil located in another half of the mould, whereby said foils are kept separately from each other;

(c) injecting of a moulding material into said mould between said foils and around said pins;

(d) removing said pin from said mould; and

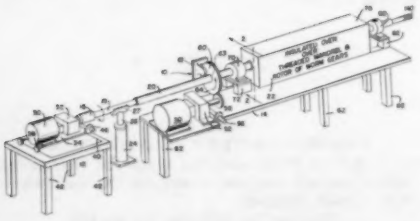
(e) removing said article from said mould.

4,427,616

APPARATUS AND PROCESS OF CONVOLUTING THERMOPLASTIC TUBING WITHOUT THE USE OF WIRES

Lyman Ketcham, Long Valley, N.J., assignor to Simmonds Precision Products Inc., Tarrytown, N.Y.

Filed Nov. 16, 1981, Ser. No. 321,974
Int. Cl.³ B29C *17/02*
U.S. Cl. 264—286 **10 Claims**



8. A method of placing a thermoplastic tubing on a mandrel for heating and convoluting said tubing without the use of wires comprising the steps of:

rotating a mandrel having a diameter slightly smaller than the inside diameter of tubing to be convoluted and having a length greater than the length of the tubing, said mandrel means having a start end provided with a removable coupling,

threading said mandrel means at the other end to shape and pitch of a given convolution and the length of the threaded portion being determined by linear speed of the tubing and by the time required to heat-set the convoluted tubing,

said mandrel means having at an extreme end a generally smooth round portion being slightly smaller in diameter than an inside dimension of the tubing,

rotating and assembling over the threaded portion and extending partially over the extreme end of the mandrel means thereof in an opposite direction from the mandrel means, and

supporting at the start end and extreme end with a support means which end allows the mandrel means to pass axially there through and having a series of freely rotating worm gears mounted in diametrically opposite pairs, alternate pairs disposed at right angles to each other, said worm gears being mounted on yoke means and

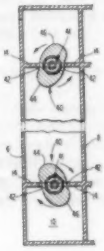
adjusting for various sized mandrel means and tubes.

4,427,617

METHOD AND APPARATUS FOR MODIFYING THE BETWEEN THE RIBS DIMENSION OF A UNIVERSALLY MOLDED BATTERY

Terry Oxenreider, Wernersville, and William J. Eberle, Reading, both of Pa., assignors to General Battery Corporation, Reading, Pa.

Continuation of Ser. No. 176,254, Aug. 7, 1980, Pat. No. 4344748. This application May 14, 1982, Ser. No. 378,451
Int. Cl.³ B29C *24/00*
U.S. Cl. 264—296 **8 Claims**



1. A method for modifying the between the ribs space of a thermal plastic battery container, said method comprising the steps of:

providing a non-circular wiping member for modifying said between the ribs space, said wiping member having a minor axis no greater than the space between said ribs;

heating said wiping member to a temperature sufficient for softening said thermal plastic;

positioning said wiper member within said battery container with said minor axis within said between the ribs space; and

rotating said wiper member within said battery case to modify the between the ribs space of said battery container.

4,427,618

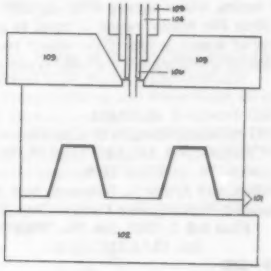
INCLINED INSULATED RUNNER MULTICAVITY INJECTION MOLDING

Jens O. Sorensen, P.O. Box 2274, Rancho Santa Fe, Calif. 92067

Continuation of Ser. No. 230,300, Jan. 30, 1981, abandoned. This application Dec. 3, 1982, Ser. No. 446,640
Int. Cl.³ B29F *1/08*
U.S. Cl. 264—328.9 **6 Claims**

1. A method of cyclic multicavity plastic injection molding, wherein the employed mold comprises a product parting surface and a runner parting surface which is different from the product parting surface, and wherein each normal production cycle comprises the steps of:

(a) injecting a hot molten plastic into a primary runner system of a multicavity mold;
(b) directing the injected plastic through the primary runner system to some inclined secondary runners, which are positioned in the runner parting surface, and which connect the primary runner system with some restriction gates;
(c) leading the directed plastic through the inclined secondary runners to the restriction gates which directly connect the inclined secondary runners with the chilling cavities;
(d) cooling the led plastic in the inclined secondary runners by transferring heat from the plastic to the walls of the inclined secondary runners which have a temperature which is lower than the temperature of the led plastic in a manner so that the plastic in the inclined secondary runners does not solidify in their entire cross-sectional region but remains molten in a central zone of their cross-sectional region;
(e) conducting the led cooled molten plastic through the restriction gates into the chilling cavities;
(f) cooling the conducted plastic in the chilling cavities by the cavity cooling system whereby the cooled plastic solidifies thereby creating a molded product; and
(g) separating the mold at the product parting surface and ejecting the molded product from the chilling cavities, which are positioned in the product parting surface, without ejecting any runner plastic impression;
wherein when the normal production cycle is terminated,



the led molten plastic within the inclined secondary runners transfers additional heat to the walls of the inclined secondary runners whereby the led molten plastic solidifies throughout its entire cross-sectional region; the method additionally comprising the following steps for reestablishing the normal production cycle following such termination:
(h) separating the mold at the runner parting surface in order to expose the solidified impressions of the inclined secondary runners;
(i) removing the solidified impressions of the inclined secondary runners in such a manner that the impressions of the restriction gate on the solidified impression of the inclined secondary runners are removed through the inclined secondary runners in a direction which is not parallel to the mold opening direction; and
(j) recombining the mold at the runner parting surface which contains the inclined secondary runners.

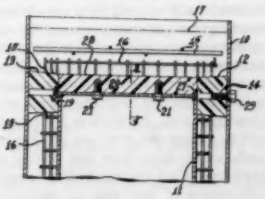
3. A method of cyclic multicavity plastic injection molding, wherein the employed mold comprises a product parting surface and a runner parting surface which is different from the product parting surface, and wherein each normal production cycle comprises the steps of:
(a) injecting a hot molten plastic into a primary runner system of a multicavity mold;
(b) directed the injected plastic through the primary runner system to some inclined secondary runners, which are positioned in the runner parting surface, and which connect the primary runner system with some restriction gates;
(c) heating at least a region of the walls of the primary runner system in order to reduce or prevent heat loss from the directed plastic to the region of the walls of the primary runner system;
(d) leading the directed plastic through the inclined secondary runners to the restriction gates which directly connect the inclined secondary runners with the chilling cavities;
(e) cooling the led plastic in the inclined secondary runners by transferring heat from the plastic to the walls of the inclined secondary runners which have a temperature which is lower than the temperature of the led plastic in a manner so that the plastic in the inclined secondary runners does not solidify in their entire cross-sectional region but remains molten in a central zone of their cross-sectional region;
(f) conducting the led cooled molten plastic through the restriction gates into the chilling cavities;
(g) cooling the conducted plastic in the chilling cavities by the cavity cooling system whereby the cooled plastic solidifies thereby creating a molded product; and
(h) separating the mold at the product parting surface and ejecting the molded product from the chilling cavities, which are positioned in the product parting surface, without ejecting any runner plastic impression;
wherein when the normal production cycle is terminated, the led molten plastic within the inclined secondary runners transfers additional heat to the walls of the inclined secondary runners whereby the led molten plastic solidifies throughout its entire cross-sectional region; the method additionally comprising the following steps for reestablishing the normal production cycle following such termination:
(i) separating the mold at the runner parting surface in order to expose the solidified impressions of the inclined secondary runners;
(j) removing the solidified impressions of the inclined secondary runners in such a manner that the impressions of the restriction gate on the solidified impression of the inclined secondary runners are removed through the inclined secondary runners in a direction which is not parallel to the mold opening direction; and
(k) recombining the mold at the runner parting surface which contains the inclined secondary runners.

4,427,619

CONCRETE FORMING SYSTEM AND METHOD OF USING IT

Carl W. Peterson, 8682 San Servera Dr., W., Jacksonville, Fla. 32217

Filed Aug. 25, 1980, Ser. No. 181,087
Int. Cl.³ B28B *1/14, 7/06, 7/34, 7/36*
U.S. Cl. 264—333 **22 Claims**



1. A method of preparing a poured reinforced concrete hollow shape having at least one hole through said wall of said shape comprising
(1) preparing a suitable form for said shape including a central form core, an outer form wall defined by at least two

releasable sections, at least one transverse hole core having an interior of a substantially nonresilient rigid plastic foam exteriorly coated throughout with a fluorocarbon elastomer and squeezingly adjoining said central core and one of said releasable sections to inhibit concrete from entering therebetween, and reinforcing steel means between said central form core and said outer form wall;

(2) pouring concrete into said form and allowing the concrete to set;

(3) removing said outer form wall and said hole cores;

(4) removing said set concrete shape from said central form core; and

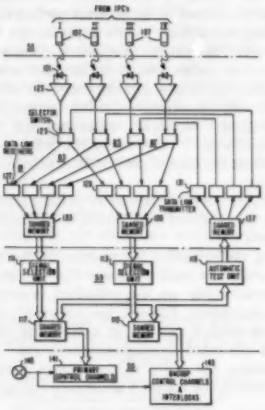
(5) recovering said reinforced concrete hollow shape with a smooth unspalled transverse hole produced by said fluorocarbon elastomer coated rigid plastic foam hole core.

4,427,620

NUCLEAR REACTOR POWER SUPPLY

Bruce M. Cook, Plum Borough, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Feb. 4, 1981, Ser. No. 231,521
Int. Cl.³ G21C *17/00*
U.S. Cl. 376—216 **16 Claims**



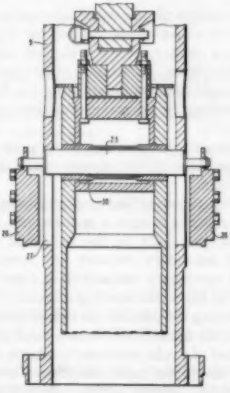
15. Apparatus for supplying electrical power including a nuclear reactor, a plurality of components, connected to said reactor, for converting the thermal energy generated by said reactor into electrical power, a plurality of sensor assemblies, connected to said reactor and to certain of said components, for sensing the process parameters of said reactor and of said certain components, each of said sensor assemblies including a plurality of like sensor means for sensing the process parameter which the sensor assembly of which said like sensor means is a part, is to sense, each of said like sensor means producing signals measuring the parameter sensed by said each of said sensor assemblies, a protection system including a plurality of like protection units, means, connecting a like sensor means of each sensor assembly to a corresponding protection unit, to impress on said protection unit the signal produced by said connected sensor means, protection apparatus, responsive to said protection system to produce an apparatus-protection operation only when more than one of said protection units receive signals from their corresponding sensor means indicating faulty operation of said reactor and/or of said certain components whose process parameters are sensed by said corresponding sensor means, a control system, means connecting said control system in controlling relationship with said reactor and with at least some at said certain components, a plurality of separate channels connected separately to each said protection unit and to said control system, for transmitting, to said control system, signals derived by each of said protection units from its corresponding sensor means, for actuating said control system to control the processes of said reactor and/or said components as aforesaid on the indication by said signals impressed on said control system of off-normal operation of said reactor and/or said components, signals being transmitted from the sensor means, each in its turn, of sensor assemblies, each assembly in its turn, during successive transmitting cycles, each of said channels including optical means only to transmit the signals from its corresponding protection unit to said control system and to prevent electrical interaction between said protection units and said control system, and signal-selection means, interposed between said channels and said control system, operating by the comparison of each signal from the sensor means of a sensor assembly with the other signals from the sensor means of said assembly, each in its turn, and responsive to such comparison, preventing the transmission, to said control system from said protection units, of signals from a sensor means of a sensor assembly which signals differ significantly from signals from like sensor means of the same sensor assembly, the signals from each sensor means which do not differ significantly from signals from like sensor means of the same assembly being herein designated as "valid signals", the said signal-selection means including means for determining the differences between each signal sensed by each sensor means and the signals sensed by the other like sensor means of a sensor assembly during each said cycle, the said signal selection means also including means for comparing the signals sensed during a later cycle with the valid signals sensed during a preceding cycle in the event that the number of like sensor means, whose signals differ significantly from signals from other like sensor means, is equal to one-half of the total number of sensor means of the sensor assembly so that determination of which signals are valid is not practicable.

4,427,621

JACKING MECHANISM FOR UPPER INTERNALS STRUCTURE OF A LIQUID METAL NUCLEAR REACTOR

James E. Gillett, and Arthur L. Wineman, both of Greensburg, Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jul. 2, 1981, Ser. No. 280,167
Int. Cl.³ G21C *19/00*
U.S. Cl. 376—260 **3 Claims**



1. A jacking mechanism for raising and lowering the upper internals structure of a liquid metal nuclear reactor which jacking mechanism comprises:

(a) at least one support column attached at one end to said upper internals structure, and having pin support means for lifting, supporting, and lowering said support column,

said pin support means located at a second end of said support column;

(b) at least one housing attached to said reactor having a slot therethrough; said housing disposed such that a portion of said pin support means extends into and through said slot and slides upward and downward in said slot during upward and downward movement of said support column, and such housing having a surface for supporting said support column via latter-mentioned components;

(c) jacking means for raising and lowering said support column with respect to said housing, said jacking means attached to said housing and to said pin support means;

(d) at least one locking plate, attached to said portion of said pin support means, extending through said slot in said housing, said locking plate rotationally free with respect to said pin support means, having attachment means to said housing and having load bearing abutting surfaces arranged such that when said support column is in either a raised or a lowered position, said locking plate can be rotated to achieve alignment of said locking plate-to-housing attachment means, and also to achieve alignment of said abutting surfaces of said locking plate with said housing surface, such that said locking plate can then be attached to said housing, said support column then being supported by a load path from the support column, through the pin support means, through the locking plate via the abutting surfaces bearing on the housing surface, through the housing, and through the reactor, such that application of any force applied by said upper internals structure via said support columns to said jacking means is prevented.

4,427,622
ALIGNMENT TOOL FOR SPACERS OF NUCLEAR REACTOR FUEL ASSEMBLIES

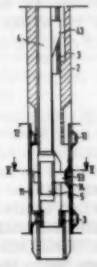
Klaus Knecht; Georg Gebhard, and Franz Rohr, all of Erlangen, Fed. Rep. of Germany, assignors to Kraftwerk Union Aktiengesellschaft, Mülheim, Fed. Rep. of Germany

Filed Sep. 1, 1981, Ser. No. 298,291

Claims priority, application Fed. Rep. of Germany, Sep. 4, 1980, 3033349

Int. Cl.³ G21C *3/34*; B21J *13/08*

U.S. Cl. 376—260 **9 Claims**



1. Alignment tool for the remotely controlled recalibration of resilient protruding contact dimples or springs in substantially square spacer grid meshes of nuclear reactor fuel assemblies, comprising an outer centering tube adapted to the cross section of a spacer mesh and rigid and resilient contact dimples protruding into the interior of the mesh in given directions, said outer centering tube having a window formed therein in the vicinity of the contact dimple, a gripper-actuating tube being concentrically surrounded by and axially movable within said outer centering tube, a pendulum rod having a free end and being disposed in the interior of said gripper-actuating tube and being axially fixed relative to said gripper-actuating tube and able to oscillate in the given protrusion direction of the resilient contact dimple to be recalibrated, a gripper attached to said free end of said pendulum rod, a restoring spring for exerting pressure on said gripper, and a run-on incline formed on said pendulum rod being engageable with said gripper-actuating tube over and above the contact dimple for radial displacement of said gripper against the pressure of said restoring spring.

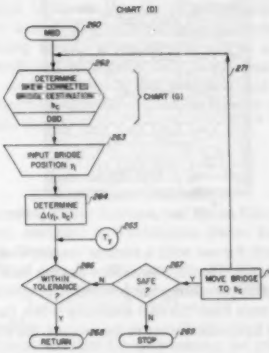
4,427,623
AUTOMATIC FUEL TRANSFER APPARATUS AND METHOD

Norman C. Howard, Danville; Kenneth R. Miller, San Jose, and Matthew C. Lussier, Santa Clara, all of Calif., assignors to General Electric Company, San Jose, Calif.

Filed Jul. 27, 1981, Ser. No. 287,102

Int. Cl.³ G21C *19/20, 17/00*

U.S. Cl. 376—263 **2 Claims**



1. Automatic fuel transfer apparatus in the containment structure of a nuclear reactor including a fuel storage pool for storing fuel bundles and a wetwell positioned between a pair of rails, said wetwell surrounding a pressure vessel containing a core for receiving fuel bundles, said containment structure including a channel connecting said storage pool and said wetwell, a refueling platform including a bridge mounted for movement on said rails, said rails being widely spaced whereby the position of said bridge is subject to skew, a trolley mounted on said bridge for lateral movement therealong with respect to said rails and a grapple depending from said trolley for lifting and moving fuel bundles, said apparatus comprising: a first bridge position sensing system mounted at one end of said bridge and communicating directly between said bridge and said containment for providing bridge position indications; a second bridge position sensing system mounted at the other end of said bridge and communicating directly between said bridge and said containment for providing bridge position indications; means responsive to the position indications from said first and second bridge sensing system for providing skew corrected bridge indications of the position of said bridge with respect to said containment structure; a trolley position sensing system communicating directly between said bridge and said trolley for providing trolley position indications of the position of said trolley with respect to said bridge; a grapple position sensing system for providing grapple position indications of the position of said grapple with respect to said trolley; means for determining the present position of said trolley with respect to said containment structure from the skew corrected indications of the position of said bridge and the indications of the position of said trolley; means for comparing said present position with a selected destination position and determining the difference; means for determining whether said difference is within a selected range of tolerance; means for moving said trolley to a position for safe travel through said channel if travel therethrough is required to reach said destination position; and means for moving said bridge and said trolley toward

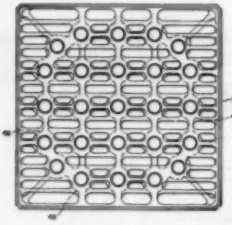
said destination position while periodically comparing present position with destination position until said difference is within said selected range of tolerance.

4,427,624

COMPOSITE NOZZLE DESIGN FOR REACTOR FUEL ASSEMBLY

George R. Marlatt, Monroeville, and David K. Allison, N. Huntingdon Township, Irwin County, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Mar. 2, 1981, Ser. No. 239,787
Int. Cl.³ G21C 1/04
U.S. Cl. 376—352 1 Claim



1. A nozzle for use with a nuclear reactor fuel assembly in a nuclear reactor, the fuel assembly having fuel rods held by grids, the grids permitting the possibility of upward movement of the fuel rods from the fuel assembly when the fuel rods are acted on by hydraulic forces in the reactor, the nozzle comprising:

the casting of square configuration having walls which form a central opening through which coolant flows in an axial direction;

ribs in said casting extending across the central opening, said ribs including arms integrally joined with the casting walls and forming openings for allowing coolant flow through the nozzle;

a separable removable plate on said casting of a size which corresponds with the size of the central opening, said plate being of a thickness which permits it to be stamped from sheet material;

said plate further having spaced ligaments defining axially extending openings therein designed to a size and configuration for directing coolant flow in predetermined directions through the nozzle, and for causing a pressure drop of predetermined magnitude across the nozzle to help assure flow of coolant in the desired amount through the nozzle, the ligaments having a thickness which permits them to be stamped from sheet material with the ligaments being disposed to overlie the ends of all said fuel rods when the nozzle is attached to the fuel assembly, and thus prevent ejection of the fuel rods by hydraulic forces which act therein during operation in the reactor.

4,427,625

SILVER CADMIUM OXIDE ELECTRICAL CONTACTS

Philip Wingert, Greensburg; Larry J. Gaudino, Latrobe, and Han J. Kim, Greensburg, all of Pa., assignors to GTE Products Corporation, Stamford, Conn.

Filed Oct. 15, 1981, Ser. No. 311,363
Int. Cl.³ F16H 13/02
U.S. Cl. 419—21 1 Claim

1. A process for the production of silver-cadmium oxide electrical contact material comprising

(a) adding a sufficient amount of copper to submicron silver powder to achieve from about 100 parts to about 1000 parts per million of copper in contact material, said copper being relatively uniformly distributed on the surfaces of said silver powder,

(b) blending a sufficient amount of cadmium oxide particles to said silver-copper powder to form a relatively uniform admixture to achieve a cadmium oxide concentration of from about 5% to about 25% by weight,

(c) reducing said cadmium oxide in said admixture to cadmium at a temperature of from about 321° C. to about 550° C.,

(d) oxidizing the resulting silver-copper-cadmium material for a sufficient time to oxidize all of said cadmium to substantially spherical cadmium oxide particles and

(e) sintering the resulting mixture to achieve a silver-cadmium oxide compact having a density greater than about 96% of theoretical.

4,427,626

METHOD OF MAKING PRODUCTS FROM POWDERS OF TOOL STEELS

Alexei K. Petrov, ulitsa Verkhnyaya, 9/27, kv. 7, Zaporozhie; Vladimir B. Akimenko, Prospekt Mira, 184, korpus 1, kv. 79, Moscow; Vladimir N. Zhuchin, ulitsa Lenina, 102, kv. 7, Elektrostal Moskovskoi oblasti; Alexei G. Tsipunov, prospekt Lenina, 151, kv. 160, Zaporozhie; Elena N. Smirnova, ulitsa Pobedy, 75, kv. 17, Zaporozhie; Jury N. Skornyakov, ulitsa Shkolnaya, 27, kv. 124, Zaporozhie, and Alexandr F. Klimenko, ulitsa Komarova, 5, kv. 66, Zaporozhie, all of U.S.S.R.

PCT No. PCT/SU80/00021, § 371 Date Oct. 9, 1981, § 102(e) Date Oct. 9, 1981, PCT Pub. No. WO81/02264, PCT Pub. Date Aug. 20, 1981
PCT Filed Feb. 13, 1980, Ser. No. 314,089
Int. Cl.³ B22F 3/16
U.S. Cl. 419—28 2 Claims

1. A method of making products from powders of tool steels, comprising charging a powder into a capsule, sealing the capsule, heating and then extruding the capsule with the powder contained therein, wherein the heating of said sealed capsule is carried out in two steps wherein said sealed capsule is first heated up to a temperature of 700° to 1000° C., whereupon it is then depressurized and heated up to a temperature of 1050° to 1200° C.

4,427,627

COPPER ALLOY HAVING HIGH ELECTRICAL CONDUCTIVITY AND HIGH MECHANICAL CHARACTERISTICS

Jean-Paul Guerlet, and Claude Niney, both of Paris, France, assignors to Comptoir Lyon-Alemand Louyot, Paris, France

Continuation of Ser. No. 63,702, Aug. 6, 1979, abandoned, which is a continuation of Ser. No. 883,247, Mar. 3, 1978, abandoned.
This application Mar. 24, 1981, Ser. No. 247,092
Claims priority, application France, Mar. 9, 1977, 77 06999; Feb. 7, 1978, 78 03410
Int. Cl.³ C22C 9/06
U.S. Cl. 420—496 5 Claims

1. A copper alloy consisting essentially of 0.1 to 0.50% by weight of cobalt, 0.04 to 0.25% by weight of phosphorus, the remainder being copper, said cobalt and phosphorus being present in a weight ratio of cobalt to phosphorus of between 2.5 to 5, said alloy having a high electrical conductivity of at least 75% IACS; and said alloy, when subjected to thermal-mechanical treatment having a hardness of at least about 90 HV.

4,427,628

DENTAL AMALGAM ALLOY

Jeffery J. Cheetham, 5 Brunsdon St., Bayswater, Victoria, Australia (3153)

Filed Oct. 19, 1981, Ser. No. 312,777
Claims priority, application Australia, Nov. 28, 1980, PE6679
Int. Cl.³ C22C 5/06, 30/02, 30/04, 30/06
U.S. Cl. 420—504 7 Claims

1. A dental amalgam alloy which is a blend of high-silver particulate dental amalgam alloy consisting essentially by weight of about 60 to 80% silver, about 1 to 6% copper, about 23 to 33% tin and 0 to about 3% zinc, and a spherical low-silver particulate dental amalgam alloy consisting essentially by weight of about 41 to 48% silver, about 23 to 33% tin, about 20 to 28% copper and about 0.5 to 4% indium, said high-silver alloy being present in an amount from about 30 to 70% by weight of the total alloy blend, and said low-silver alloy having been rendered spherical by entraining solid chip particles in a stream of an inert carrrier gas under pressure, passing the stream of inert carrier gas containing the particles through a heating zone so as to melt at least a surface stratum of the particles and then cooling the particles so as to solidify the melted portions of the particles.

4,427,629

PROCESS FOR METAL-ENRICHMENT OF LEAD BULLION

Jitesh R. Mehta, and Andrew H. Larson, both of Eagan, Minn., assignors to GNB Batteries Inc., Mendota Heights, Minn.

Filed Nov. 23, 1982, Ser. No. 444,259
Int. Cl.³ C22C 11/00, 11/04, 11/06, 11/08
U.S. Cl. 420—563 23 Claims

1. A process for metal-enrichment of lead bullion wherein an alkali metal-desired metal intermetallic is added to the bullion and said desired metal is stripped from said intermetallic into said bullion, comprising:

(a) melting and heating said lead bullion to a temperature between 650° F. and 900° F.;

(b) agitating said molten bullion;

(c) adding said alkali metal-desired metal intermetallic in which said desired metal consists of a metal selected from the group comprising antimony, cadmium, copper, nickel, silver and tin to said bullion;

(d) mixing said intermetallic into said bullion;

(e) adding to said bullion a stripping reagent selected from the group comprising water, sulfur, selenium, tellurium, phosphorous, chlorine, air, oxygen-enriched air, nitre and mixtures thereof;

(f) mixing said reagent into said bullion to selectively react said reagent with said alkali metal in said intermetallic and thereby dissociating said intermetallic, liberating and solubilizing said desired metal into said bullion and forming insoluble alkali metal-stripping reagent compounds which rise to form a skimmable residue dross;

(g) forming said desired metal-enriched lead bullion and a residue dross substantially void of said desired metal; and

(h) separating said residue dross from said enriched bullion.

4,427,630

GAS DEODORIZATION METHOD

Toshio Aibe, Toyonaka; Yoshio Tsutsumi, Takatsuki, and Katsuya Noguchi, Toyonaka, all of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

Filed Dec. 4, 1981, Ser. No. 327,736
Claims priority, application Japan, Dec. 5, 1980, 55-172500
Int. Cl.³ A61L 9/015, 9/00, 9/16
U.S. Cl. 422—4 10 Claims

1. A method of deodorization, which comprises contacting a gas containing a sulfur compound and a nitrogen compound as ill-smelling components with an adsorbent consisting of activated carbon having supported thereon bromine and an acid having a vapor pressure at 50° C. of not higher than 10 mmHg, the amount of bromine supported on the activated carbon being 3 to 20 weight % based on the activated carbon.

4,427,631

POVIDONE IRRADIATION

Thomas G. Bunting, Randolph; Dominic A. Centrone, Flemington, both of N.J.; Richard S. Sackler, Greenwich, Conn., and Alfred Halpern, Great Neck, N.Y., assignors to Euroceltique, S.A., Luxembourg, Luxembourg

Filed May 27, 1982, Ser. No. 382,380
Int. Cl.³ C08F 8/00; B01J 19/08; A61L 2/08
U.S. Cl. 422—22 13 Claims

1. Method for the sterilization of povidone solutions without degradation thereof and without gelation of the povidone, which comprises subjecting a solution of povidone in the presence of iodine and iodide ions to gamma radiation in a dose sufficiently high to cause gelation of said povidone in the absence of said iodine and said iodide ions, said iodine and said iodide ions being present in an amount and in an iodine to iodide ratio sufficient to prevent said gamma radiation dose from causing said povidone to gel, whereby said solution is sterilized without degradation or gelation thereof and without loss of available iodine.

4,427,632

ANALYTICAL ELEMENT

Kenichiro Okaniwa; Mikio Koyama, and Shozo Kikugawa, all of Hino, Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Filed Apr. 22, 1982, Ser. No. 370,854
Claims priority, application Japan, Apr. 29, 1981, 56-65446
Int. Cl.³ G01N 33/52, 33/66
U.S. Cl. 422—56 17 Claims

1. An analytical element for determining the presence of a component in a liquid sample comprising:

(a) a light-transmissive and liquid-impermeable support;

(b) at least one reagent layer containing at least one reagent reactive with said component and containing a hydrophilic colloid; and

(c) at least one hydrophobic developing layer having a fibrous structure and being positioned on the side of said reagent layer opposite to said support whereby the component in said liquid sample permeates through said developing layer toward said reagent layer, said developing layer formed by coating said reagent layer with a homogeneous dispersion comprising a hydrophobic organic macromolecular polymer having reactive groups and a fibrous material.

4,427,633

GAS MIXING APPARATUS FOR METASTABLE TRANSFER EMISSION SPECTROSCOPY

Jon R. Peacock, Mission Viejo, and Robert L. Schmidt, Placentia, both of Calif., assignors to Beckman Instruments, Inc., Fullerton, Calif.

Filed Jul. 3, 1980, Ser. No. 165,529
Int. Cl.³ G01N 21/76
U.S. Cl. 422—83 8 Claims

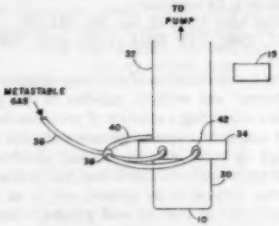
1. In combination with an analyzing means for analyzing a sample material constituent in a first gas, means defining a supply of said first gas, generating means for exciting a gas to a metastable state, means defining a supply of a second gas, and means for supplying said second gas to said generating means;

means for mixing an excited metastable second gas in said first gas to transfer energy from said metastable gas to molecules of a sample material carried in said first gas causing characteristic spectral emission, said mixing means comprising:

conduit means connected to and in fluid communication with said analyzing means, having a wall defining a primary channel of uniform cross section through which one

of said first or second gases is conveyed from means supplying said gas;

a manifold means exterior to said conduit means defining a secondary channel for conveying the other of said first or second gases, from said means supplying said gas into said primary channel of said conduit means, to mix said gases, said secondary channel having an exit portion communi-



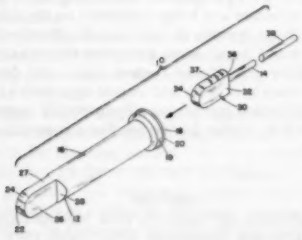
cating with said primary channel through a plurality of openings in said wall of said conduit means, said exit portion opening through said conduit wall in a manner to provide an unobstructed primary channel of uniform cross section, and to direct said gas conveyed by said manifold means into the unobstructed flow of the other of said gases conveyed by said conduit means to mix said gases together for reaction and analysis.

4,427,634

APPARATUS FOR MICROSCOPIC EXAMINATION OF SPECIMENS

William J. Truglio, Sayville, N.Y., assignor to Wright Laboratories, Inc., Bohemia, N.Y.

Filed Mar. 12, 1982, Ser. No. 357,759
Int. Cl.³ B01L *3/00*; C12M *1/28*
U.S. Cl. 422—99 **5 Claims**



1. Apparatus for microscopically examining a specimen comprising:

a transparent cylindrical tube having open and closed opposite axial ends;

said closed end of said tube being formed with closely spaced, flat walls and diametrically spaced circumferentially extending narrow other walls defining a diametrically extending centrally located well for containing said specimen while being examined in a microscope;

wherein said well is substantially rectangular in cross-section and has a first dimension substantially equal to the diameter of said tube and a second dimension less than one half the diameter of said tube;

an insert for said well, said insert having an optically transparent flat body with flat, opposed sides, said body being slightly smaller in cross-sectional area than the cross-sectional area of the interior of said well to facilitate insertion into said well and to serve as a slide support for said specimen in said well during examination thereof in said microscope; and

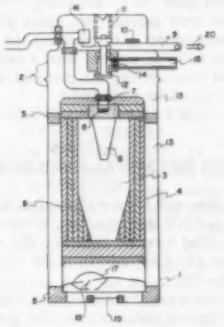
said insert having a stem longer than the axial length of said tube and secured to one end of said body to facilitate insertion of said body through said tube into said well and removal therefrom.

4,427,635

CHEMICAL OXYGEN GENERATOR

Rainer Hahn, Afrade, Fed. Rep. of Germany, assignor to Drägerwerk Aktiengesellschaft, Afrade, Fed. Rep. of Germany

Filed Nov. 6, 1981, Ser. No. 318,912
Claims priority, application Fed. Rep. of Germany, Nov. 29, 1980, 3045111
Int. Cl.³ G05D *16/00*; A62B *21/00*; B01J *19/00*
U.S. Cl. 422—113 **1 Claim**



1. In a chemical oxygen generator for an emergency breathing system having a tank, a chemical in the tank containing oxygen in a chemically bound state, an ignition device operable to initiate a chemical reaction with the chemical to generate oxygen to be supplied to a user, and a trigger device connected to the ignition device for triggering the ignition device responsive to manual actuation, the improvement comprising a tightly closed pressure vessel enclosing a compartment containing the tank, a ceramic fiber fleece concentrically retaining the tank within the compartment of said pressure vessel to define a space therebetween for containing a supply of pressurized oxygen, an original supply of pressurized oxygen provided in said pressure vessel before any ignition of said ignition means, said pressure vessel having an opening for passing oxygen from said space, a valve between said space and the opening, said valve including a stem movable between a closed position and an open position to close and open a passage between said space and said opening, spring means for resiliently urging said stem into said open position, a switch operated by a predetermined movement of said stem toward said open position to energize said ignition device, and wherein the trigger device includes a trigger pin releasably engaged to said stem for holding said stem in said closed position, said stem being operable responsive to the manual release of said trigger pin to simultaneously move into said open position and engage said switch to trigger ignition, and a dosing throttle in said passage for passing a constant flow of oxygen therethrough from said space, so that upon manual release of said trigger, said original supply of oxygen is provided over said dosing throttle before the chemically bound oxygen is generated and supplied over said throttle, a burst plate operatively mounted to said pressure vessel, said burst plate being operable to burst and relieve excess pressure from said space, said tank having a passageway communicating an interior of said tank with said space, a diaphragm over said passageway, a point connected to said tank and on a side of said diaphragm opposite an interior of said tank for containing the oxygen in a chemically bound

state, so that when said original supply of oxygen is provided over said dosing throttle, and chemically bound oxygen generated in said tank, a pressure of the generated chemically bound oxygen pushes said diaphragm against said point to rupture said diaphragm and allow passage of the generated chemically bound oxygen over said passageway and to said space.

4,427,636

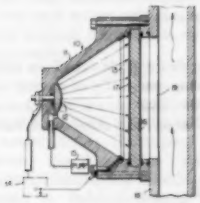
METHOD AND APPARATUS FOR MAKING OZONE

David N. Obenshain, Swanton, Md., assignor to Westvaco Corporation, New York, N.Y.

Division of Ser. No. 200,782, Oct. 27, 1980, Pat. No. 4,329,212. This application Dec. 21, 1981, Ser. No. 332,516

Int. Cl.³ C01B *13/00*

U.S. Cl. 422—186.07 **9 Claims**



1. Apparatus for producing ozone comprising a duct, an inlet for introducing an oxygen bearing gas into said duct and an outlet for discharging ozone from said duct, one or more [openings in said duct through which one or more ozone] *energy* generating cells [may be positioned] *associated with said duct and adapted to produce energy that is converted into ultraviolet radiation for converting oxygen into ozone, said energy generating cells comprising cathode ray generators which are oriented so that the electrons emitted from their cathodes bombard a UV emitting source included within each cell to produce UV radiation only in the range of from about 130 to 170 nm with substantially none below 130 nm and none above 170 nm, and means* for exposing the oxygen bearing gas *in said duct* to the ultraviolet radiation *produced by said UV emitting source* to convert at least a portion of the oxygen *bearing gas* to ozone [, the improvement wherein said ozone generating cells generate UV radiation only in the range of from about 130 to 170 nm with substantially none below 130 nm or above 200 nm].

4,427,637

APPARATUS FOR PRODUCING AN ALKALI METAL SALT OF A MINERAL ACID, AND A PROCESS

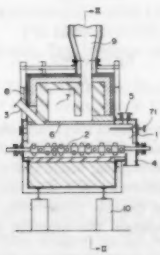
Hidemaro Iwashita, Tokyo; Fumiaki Mieno, Nobeoka; Yoshinori Kiura, Nobeoka, and Kenichi Hayashi, Nobeoka, all of Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Sep. 30, 1981, Ser. No. 307,164

Claims priority, application Japan, Sep. 30, 1980, 55-135305; Jul. 3, 1981, 56-103173

Int. Cl.³ B01F *7/04;* **C01B** *7/01;* **C01D** *5/02*

U.S. Cl. 422—198 **7 Claims**



1. In an apparatus for producing a potassium sulfate salt potassium chloride and sulfuric acid comprising a horizontally elongated muffle furnace provided with a raw material inlet at one end thereof and a reaction product outlet at the other end thereof, means for heating the furnace, means for feeding raw materials associated with the inlet, means for discharging a reaction product associated with the outlet, means for exhausting a generated gas and agitating means provided in the muffle furnace, said agitating means comprising a pair of contra-rotating shafts extending longitudinally through the muffle furnace in parallel and provided with a plurality of agitating elements arranged longitudinally and circumferentially on the shafts at a predetermined angle between the nearest longitudinally adjacent agitating elements in the circumferential direction, the distance between the pair of contra-rotating shafts being kept so that the agitating elements on one of the pair of contra-rotating shafts intervene with the corresponding agitating elements of the other contra-rotating shaft on a common plane of rotation thereof;

the improvement in which each of said pair of shafts comprises:

a first portion on the end of each shaft nearest the raw material inlet,

a second portion on the end of each shaft nearest the reaction product outlet,

a plurality of sets of agitating elements arranged longitudinally over the entire length of the shaft, each set comprising at least two agitating elements arranged circumferentially on the shaft at the same distance from the end of the shaft, and

wherein the smallest angle between the nearest longitudinally adjacent agitating elements in the circumferential direction is from about 30° to about 70° in said first portion and is about 90° in said second portion.

4,427,638

APPARATUS FOR SEMICONDUCTOR RIBBON-TO-RIBBON CONVERSION

Ralph J. Ellis; Richard W. Gurtler, both of Mesa, and Kailuri R. Sarma, Tempe, all of Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Sep. 14, 1981, Ser. No. 301,627

Int. Cl.³ C30B *13/06, 13/32*

U.S. Cl. 422—250 **2 Claims**

1. An apparatus for use in converting polycrystalline ribbon having two major surfaces terminating at edges thereof to macrocrystalline ribbon wherein a molten zone is formed in said polycrystalline ribbon by an impinging energy beam and said molten zone is moved along said ribbon, said apparatus comprising: carrier means comprising a first channel shaped recess into which the edge of said ribbon can be placed for supporting said ribbon; and masking means integral with said carrier means protecting portions of said ribbon adjacent said edges from said impinging energy beam, said masking means comprising a portion of said carrier means overlapping one of said surfaces.

4,427,639

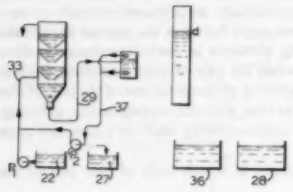
ION EXCHANGE PROCESS

Alexander Himsley, Toronto, Canada, assignor to Himsley Engineering Limited, Toronto, Canada

Continuation of Ser. No. 875,426, Feb. 6, 1978, abandoned. This application Mar. 9, 1981, Ser. No. 242,034

Int. Cl.³ C01G *43/00*

U.S. Cl. 423—7 **6 Claims**



1. A process for recovery or uranium in relatively concentrated form from a feed solution relatively weak in uranium ions and containing ferric ions as an unwanted component, comprising passing batches of anion exchange resin particles having preferential affinity for uranium complex anions successively along an absorption column; contacting said batches in the column with said feed solution and permitting uranium ions, together with ferric ions, to load onto the particles as complex anions and withdrawing from the absorption column a barren solution substantially exhausted of uranium ions and containing non-absorbed ferric ions; removing uniform batches of the loaded particles from the absorption column; isolating each of said uniform batches of loaded resin particles removed from the absorption column in a conditioning chamber; conditioning each isolated batch by flowing through it at a controlled rate a conditioning solution that is rich in uranium ions and weak in ferric ions and is at a pH effective to increase the ratio between the uranium ions and the ferric ions loaded on the resin particles by causing ion exchange to occur between the conditioning solution and the resin whereby further uranium ions are loaded onto the resin and some of the ferric ions are removed from the resin and concomitantly withdrawing from the conditioning chamber a spent conditioning solution containing uranium ions and ferric ions; recycling the spent conditioning solution to said feed solution; moving the conditioned batches to an elution column and passing them successively along the elution column; contacting the conditioned batches in the column with sulphuric acid eluant solution that strips the uranium ion and ferric ion from the resin particles; recovering from the elution column a concentrated eluate that is a relatively concentrated uranium solution at acidic pH, and contains a relatively low concentration of ferric ions; subjecting the concentrated eluate to uranium-recovery treatment, and recovering a uranium-rich yellow cake therefrom; and wherein said conditioning solution is a liquid selected from the group consisting of a portion of the concentrated eluate recovered from the elution column that is modified by increasing its pH by addition of a base thereto, and a solution comprising a portion of said yellow cake dissolved in sulphuric acid.

4,427,640

SEQUENTIAL PROCESS FOR EXTRACTION AND RECOVERY OF VANADIUM AND URANIUM FROM WET PROCESS ACIDS

P. David Bowerman, Edmond, Okla., and Michael F. Lucid, Houston, Tex., assignors to Kerr-McGee Chemical Corporation, Oklahoma City, Okla.

Filed Oct. 6, 1980, Ser. No. 194,444

Int. Cl.³ C01G *43/00*

U.S. Cl. 423—10 **16 Claims**

1. A process for sequentially recovering vanadium and uranium, each substantially free of contamination by the other, comprising:

contacting an aqueous acidic solution containing vanadium in the pentavalent state, uranium in the hexavalent state and at

least about 0.25 mole fluoride per mole vanadium with a first organic extractant consisting essentially of a water immiscible organic diluent and a neutral organo-phosphorus compound, or oxonium salts thereof, said compounds having the formula

wherein R, R′ and R″ are selected from the group consisting of hydrogen, alkyl, cycloalkyl, aryl, aralkyl, alkoxy and aryloxy radicals, provided that R, R′ and R″ are not all hydrogen, to form a first organic phase containing the vanadium separate from the aqueous acidic solution;

contacting said first organic phase containing the vanadium with an aqueous stripping solution to separate the vanadium from said first organic phase;

recovering the aqueous stripping solution containing vanadium;

contacting said aqueous acidic solution remaining after contact with the first organic extractant with a second organic extractant consisting essentially of a water immiscible organic diluent, a neutral organo-phosphorus compound or oxonium salts thereof, said compounds having the formula

wherein R, R′ and R″ are selected from the group consisting of hydrogen, alkyl, cycloalkyl, aryl, aralkyl, alkoxy and aryloxy radicals, provided that R, R′ and R″ are not all hydrogen, and a dialkylphosphoric acid having the formula

wherein R_1 and R_2 represent alkyl radicals, the total number of carbon atoms in said dialkylphosphoric acid being at least 10, to form a second organic phase containing the uranium separate from the aqueous acidic solution;

contacting said second organic phase with an aqueous stripping solution to separate the uranium from said second organic phase; and

recovering the aqueous stripping solution containing uranium.

4,427,641

METHOD OF RECOVERING URANIUM FROM WET PROCESS PHOSPHORIC ACID WITH ENHANCED CONTENT OF URANIUM

Seizi Yoshikawa, Yamaguchi, and Ryuichi Nakamura, Ube, both of Japan, assignors to Central Glass Company Limited, Ube City, Japan

Filed Jul. 27, 1981, Ser. No. 287,151
Claims priority, application Japan, Jul. 28, 1980, 55-102409
Int. Cl.³ B01D *11/00*; B01F *11/00*; C01G *43/00*; C01B *25/16*
U.S. Cl. 423—18 10 Claims

1. In a method for recovering uranium from phosphate rock containing uranium by decomposing the phosphate rock containing uranium in a wet process with sulfuric acid and phosphoric acid to form phosphoric acid containing uranium and gypsum, and recovering the uranium, the improvement comprising forming hemihydrate gypsum in a solution containing phosphoric acid and an oxidizing agent in an amount sufficient to render uranium dissolved in said solution substantially entirely hexavalent.

4,427,642

PROCESS FOR DRY DESULFURIZATION OF FLUE GAS

Norio Arashi; Yukio Hishinuma, both of Hitachi; Hidetoshi Akimoto, Ibaraki; Sadao Takahashi, Hitachi; Fumito Nakajima, Hitachi, and Kenichi Gomi, Hitachi, all of Japan, assignors to Babcock-Hitachi Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 131,893, Mar. 20, 1980, abandoned.
This application Jan. 13, 1982, Ser. No. 339,088
Claims priority, application Japan, Mar. 23, 1979, 54-34617
Int. Cl.³ B01J *8/00*; C01B *17/00, 17/02*
U.S. Cl. 423—244 17 Claims

1. A process for the dry desulfurization of flue gas containing sulfur oxides, comprising:

providing fuel coal capable of being converted to semi-coke;

combusting one portion of said coal as at least part of the fuel in a boiler or furnace to produce a flue gas containing sulfur oxides;

separately dry distilling a second portion of said coal to produce a semi-coke adsorbent;

contacting the flue gas with the adsorbent to adsorb the sulfur oxides, thereby removing the sulfur oxides from the flue gas while abrading a part of the adsorbent to produce waste adsorbent;

heating the sulfur oxides-adsorbed semi-coke adsorbent, thereby desorbing an effluent containing a high concentration of sulfur oxides and simultaneously regenerating the semi-coke while abrading another part of the adsorbent to produce waste adsorbent;

conducting the effluent to a process for the recovery of elemental sulfur therefrom;

recyclically using the regenerated semi-coke in the contacting step; and

combusting all the waste adsorbent as fuel in said boiler or furnace.

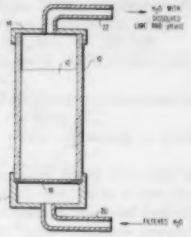
4,427,643

METHOD AND APPARATUS FOR GENERATING HIGH PH LIMEWATER

David P. Fowler, Irving, Tex., assignor to Frito-Lay, Inc., Dallas, Tex.

Filed Jun. 8, 1982, Ser. No. 386,407
Int. Cl.³ C01B *5/00, 13/14*; C01F *11/02*
U.S. Cl. 423—580 7 Claims

1. A method for producing high pH water containing no significant amounts of undissolved lime, comprising: providing a closed vessel capable of holding water under pressure and having no moving components therein, but containing a column of powdered lime; supporting the column of powdered lime on a solid porous support in the vessel; passing potable water upward under pressure through the porous support and through the particles of powdered lime contained in the column; and controlling the velocity of the potable water passing



upward through the column of lime at a rate below the transport velocity for said particles of lime.

4,427,644

PROCESS FOR THE PREPARATION OF BIVALENT METAL PEROXIDES

Werner Doetsch, Bad Hoeaningen; Helmut Dillenburg, Rheinbrohl; Paul-Wilhelm Fuchs, Bad Hoenningen, and Helmut Honig, Gelting, all of Fed. Rep. of Germany, assignors to Peroxid-Chemie GmbH, Munich, Fed. Rep. of Germany

Filed Jul. 6, 1981, Ser. No. 280,811
Claims priority, application Fed. Rep. of Germany, Jul. 7, 1980, 3025682
Int. Cl.³ C01D *1/02*
U.S. Cl. 423—582 17 Claims

1. A continuous process for the production of bivalent metal peroxides, comprising the steps of:

introducing into an intensive mixing apparatus a solid, anhydrous or hydrated oxide or hydroxide of a bivalent metal;

simultaneously introducing into the intensive mixing apparatus a solution of hydrogen peroxide, whereby the solid bivalent metal compound and the peroxide are intensively mixed and react to produce a reaction mixture containing bivalent metal peroxide;

transporting the reaction mixture directly to a rapid dryer; and

rapidly drying the reaction mixture to produce the bivalent metal peroxide in solid form.

4,427,645

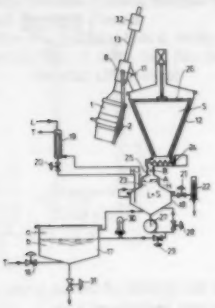
PROCESS FOR THE PREPARATION OF SOLUTIONS FROM ENVIRONMENTALLY NOXIOUS SUBSTANCES

Hans Frenken, Odenthal-Osenau; Josef Friedsam, Langenfeld, and Karl Voss, Leverkusen, all of Fed. Rep. of Germany, assignors to AGFA-Gevaert Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Dec. 8, 1980, Ser. No. 214,466
Claims priority, application Fed. Rep. of Germany, Dec. 14, 1979, 2950403
Int. Cl.³ B01F *1/00*
U.S. Cl. 423—658.5 4 Claims

1. A process for the preparation of solutions from environmentally noxious substances in which the various proportions required for the batchwise preparation of the solutions are accurately measured, mixed and dissolved, maintained at a certain temperature, filtered and delivered to a storage vessel, characterised in that:

(a) the environmentally noxious substance to be dissolved, contained in a container, is placed on a receiver;



(b) the container is securely attached to the receiver;
(c) the lid or closure member of the container is replaced by an adaptor, and the container is connected air-tightly and dust-free by way of the adaptor to a feed connection of a storage bin by means of a rapid closure device;
(d) the environmentally noxious substance is poured into the storage bin without contact with the environment by pivoting the receiver together with the container through 180° about an axis of rotation, and the substance is agitated by a stirrer to prevent the formation of bridging bonds;
(e) a given quantity of solvent is measured into a measuring and mixing vessel which is arranged under the storage bin and connected to the storage bin only by a dosing screw and in such a manner that it is air-tightly sealed-off from outside;
(f) a given quantity of the environmentally noxious substance is then added from the dosing screw;
(g) the substance is mixed with the solvent by pumping with a mixing and delivery pump and dissolved therein;
(h) after the substance has been mixed with the solvent and dissolved in it, the solution of the substance in the solvent is pumped into a storage vessel through a filter by means of the mixing and delivery pump, and
(i) to optimize the solution of the substance in the solvent, the measuring and mixing vessel, the storage vessel and the solvent in a solvent container are maintained at a certain temperature.

4,427,646

USE OF RADIOLABELED PEPTIDE DERIVED FROM CROSSLINKED FIBRIN TO LOCATE THROMBI IN VIVO

Stephanie A. Olexa, Hellertown, Pa.; Linda C. Knight, Plainsboro, N.J., and Andrei Z. Budzynski, Glenside, Pa., assignors to Research Corporation, New York, N.Y.

Filed Apr. 2, 1981, Ser. No. 250,174

Int. Cl.³ A61K *49/00, 43/00;* **C07G** *7/00;* **C07C** *103/52*

U.S. Cl. 424—1.1 **14 Claims**

1. A method of locating a thrombus, comprising the steps of: administering a radiolabeled peptide selected from the group consisting of Fragment E_1 isolated from cross-linked fibrin, Fragment E_2 isolated from cross-linked fibrin, and peptides having an amino acid sequence intermediate between Fragments E_1 and E_2 to a human or animal, and externally detecting radiation emitted by said radiolabeled peptide.

4,427,647

METHOD AND REAGENT FOR MAKING A RADIOPHARMACEUTICAL COMPOSITION BASED ON PERTECHNETATE

Anthony Brockas; Roy Abrahams, and James D. Kelly, all of Amersham, England, assignors to Amersham International Limited, England

Filed Jul. 27, 1981, Ser. No. 286,752

Claims priority, application United Kingdom, Aug. 12, 1980, 8026198; May 15, 1981, 8114935

Int. Cl.³ A61K *43/00, 49/00*

U.S. Cl. 424—1.1 **9 Claims**

1. In a method of making a radiopharmaceutical composition by mixing an aqueous solution of pertechnetate with a reducing agent comprising tin as metal or Sn^{++} to reduce the pertechnetate and a complexing agent to form a complex with the reduced technetium,

the improvement which comprises incorporating in the composition a nitrate or nitrite or a mixture of said nitrate and nitrite in an amount to diminish oxidation of Sn^{2+} to Sn^{4+} during preparation and storage of the complex.

4,427,648

DIPYRIDAMOLE-CONTAINING PHARMACEUTICAL FORM

Rolf Brickl, Warthausen; Peter Gruber, Biberach; Gottfried Schepky, Biberach, and Gerhard Bozler, Biberach, all of Fed. Rep. of Germany, assignors to Dr. Karl Thomae GmbH, Biberach an der Riss, Fed. Rep. of Germany

Filed Jun. 17, 1982, Ser. No. 389,282

Claims priority, application Fed. Rep. of Germany, Jun. 19, 1981, 3124090

Int. Cl.³ A61K *9/00, 9/20, 9/48, 31/445*

U.S. Cl. 424—16 **22 Claims**

1. A method of treating cardiovascular disorders in a host in need of such treatment which comprises administering to said host a cardiovascularly effective amount of an uncoated composition consisting essentially of (i) dipyridamole or an acid addition salt thereof and (ii) at least one pharmacologically acceptable acid or acid substance, the total amount of acid from acid addition salt present and acid or acid substance being in a ratio of at least about 5 acid equivalents to 1 mol of dipyridamole.

4,427,649

PHARMACEUTICAL COMPOSITIONS

John T. Dingle, Whittlesford; John L. Gordon, Cambridge; Geraint Jones, Macclesfield; Clive G. Knight, Huntingdon, and John S. Lowe, Wilmslow, all of England, assignors to Imperial Chemical Industries Limited and National Research Development Corporation, both of London, England

Continuation of Ser. No. 777,427, Mar. 14, 1977, abandoned. This application Dec. 31, 1981, Ser. No. 336,167

Claims priority, application United Kingdom, Mar. 19, 1976, 11147/76

Int. Cl.³ A61K *9/16, 9/42, 31/575, 47/00*

U.S. Cl. 424—38 **8 Claims**

1. A method for the treatment of inflammation at a site involving an enclosed cavity, in a host in need of such treatment, which comprises administering into said cavity an effective amount of a pharmaceutical composition comprising liposomes containing an anti-inflammatory corticosteroid bearing an 11-hydroxy substituent and bearing a lipophilic substituent which is attached by means of a carboxylic ester linkage to the residue of a hydroxy group which itself is attached to the 21-position of the corticosteroid, the said lipophilic substituent comprising an acyclic aliphatic chain of 15, 16 or 17 carbon atoms.

4,427,650

ENRICHED PLASMA DERIVATIVE FOR ADVANCEMENT OF WOUND CLOSURE AND HEALING

Michael Stroetmann, Münster, Fed. Rep. of Germany, assignor to Serapharm Michael Stroetmann, Münster, Fed. Rep. of Germany

Filed Jun. 7, 1982, Ser. No. 385,664

Claims priority, application Fed. Rep. of Germany, Jun. 25, 1981, 3124962; European Pat. Off., Dec. 18, 1981, 81110615

Int. Cl.³ A61K *9/14, 35/14, 37/00*

U.S. Cl. 424—46 13 Claims

1. An enriched plasma derivative for supporting wound closure and healing, containing 60 to 96% by weight of fibrinogen and 0.5 to 5% by weight of a fibrinolysis inhibitor, wherein

(a) the fibrinogen is largely free from cryo-insoluble globulin;

(b) the plasma derivative additionally contains 0.1 to 15% by weight of thrombin and/or prothrombin;

(c) all components are present in biologically active, solid powdery form at temperatures of up to 56° C.; and

(d) these solid components are mixed with each other.

4,427,651

ENRICHED PLASMA DERIVATIVE FOR ENHANCEMENT OF WOUND CLOSURE AND COVERAGE

Michael Stroetmann, Münster, Fed. Rep. of Germany, assignor to Serapharm Michael Stroetmann, Münster, Fed. Rep. of Germany

Filed Jun. 7, 1982, Ser. No. 385,665

Claims priority, application Fed. Rep. of Germany, Jun. 25, 1981, 3124962

Int. Cl.³ A61K *9/14, 35/14, 37/00*

U.S. Cl. 424—46 20 Claims

1. An enriched plasma derivative composition useful for accelerated hemostasis and optimized control of wound closure, consisting essentially of thrombin, a desiccating and stabilizing agent, and a fibrinolysis inhibitor, the constituents of the composition being in powdery state, and said composition being in the form of a sprayable admixture.

4,427,652

ANTIGINGIVITIS COMPOSITION

Abdul Gaffar, Somerset, N.J., assignor to Colgate-Palmolive Company, New York, N.Y.

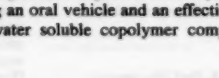
Division of Ser. No. 221,582, Dec. 31, 1980, Pat. No. 4,342,857. This application Dec. 3, 1981, Ser. No. 327,001

Int. Cl.³ A61K *7/18*

U.S. Cl. 424—52 10 Claims

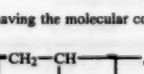
1. An oral composition adapted to inhibit symptoms of gingivitis comprising an oral vehicle and an effective antigingivitis amount of a water soluble copolymer composed predominantly of:

(A) units having the molecular configuration



, and

(B) units having the molecular configuration



the ratio of (A) units (n) to (B) units (m) ranging from about 2:1 to about 25:1.

4,427,653

METHOD OF MAKING MONOCLONAL ANTIBODIES

Timothy A. Springer, Brookline, Mass., assignor to President and Fellows of Harvard College, Cambridge, Mass.

Filed Jan. 26, 1981, Ser. No. 228,063

Int. Cl.³ C12P *21/00*; A61K *39/00*; C12N *5/00*

U.S. Cl. 424—85 1 Claim

1. A method of preparing one or more monoclonal antibodies, said method comprising the steps of

(a) providing a cell-free liquid containing a plurality of different antigens,

(b) contacting a sample of said liquid with one or more monoclonal antibodies each specific to a said antigen to form complexes between said monoclonal antibodies and antigens present in said liquid and then removing said complexes from said liquid to yield a partially purified liquid substantially free of antigens specific to said one or more monoclonal antibodies,

(c) immunizing an animal with said partially purified liquid,

(d) fusing spleen cells from said immunized animal to myeloma cells to form hybridomas capable of producing monoclonal antibodies,

(e) culturing said hybridomas to produce said monoclonal antibodies,

(f) isolating one or more of said monoclonal antibodies,

(g) repeating steps (b) through (f) in sequence, at least once, using in step (b) at least one monoclonal antibody of step (f) in the previous sequence, and

(h) terminating said method when, or before, said liquid contains one antigen.

4,427,654

WOUND HEALING COMPOSITIONS AND FORMULATIONS

Paul R. Austin, Wilmington, Del., assignor to University of Delaware, Newark, Del.

Filed Jul. 27, 1982, Ser. No. 402,296

Int. Cl.³ A61K *35/56*

U.S. Cl. 424—95 8 Claims

1. A wound healing composition comprising an effective amount of finely divided cephalopod skeletons in a compatible topical carrier.

4,427,655

ANTIBIOTICS-875A AND PRODUCTION THEREOF

Edward O. Stapley, Metuchen, N.J., assignor to Merck & Co., Inc., Rahway, N.J.

Filed Apr. 12, 1982, Ser. No. 367,529

Int. Cl.³ A61K *35/00*; C12P *1/06*

U.S. Cl. 424—115 6 Claims

1. Antibiotics-875A which have the following characteristics:

(a) U.V. Max. 262 nm unshifted by pH change (acidic/neutral/basic),

(b) Acid hydrolysis (6 N HCl at 100° C. for 18 hr) yields uracil,

(c) Paper electrophoresis with pH 7.0 phosphate buffer at 600 volts (D.C.) for 3 hours shows:
875A1—Movement toward cathode
875A2—Movement toward cathode
875A4—Movement toward cathode
875A3—No movement
875A5—No movement

(d) Paper electrophoresis with pH 10.0 carbonate buffer to 600 volts (D.C.) for 3 hours shows: 875A1 to 875A5—all move toward anode with same mobility

(e) TLC data using isopropanol-formic acid-water (4:1:1) and cellulose plates—detection by flourescence shows:
875A1: Rf=0.37
875A2 & A4: Rf=0.48

prepared by the process of cultivating *Streptomyces hygroscopicus* ATCC 39067 under controlled aerobic conditions in

an aqueous nutrient medium at a temperature range of about 22° C. to 30° C. for at least 24 hours at a pH of from 7.5 to 8.8.

4,427,656

ANTIBIOTIC A/16686 FACTOR A_2, THE PROCESS FOR THE PREPARATION THEREOF AND THE CO-PRODUCED ANTIBIOTIC A/16686 FACTORS A_1 AND A_3

Bruno Cavalleri, Milan, and Enrico Selva, Gropello Cairoli (PV), both of Italy, assignors to Gruppo Lepetit S.p.A., Milan, Italy

Filed Jul. 31, 1981, Ser. No. 288,718
Claims priority, application United Kingdom, Aug. 16, 1980, 8026758
Int. Cl.³ A61K *35/00*; C12P *1/06*; C12R *1/45*
U.S. Cl. 424—118 8 Claims

1. Antibiotic A/16686 factor A_2 as an essentially pure individual antibiotic compound, and its non-toxic physiologically-acceptable acid addition salts, characterized in the form of free base, by:

(A) being a white amorphous powder which melts with decomposition at 210°–220° C.

(B) being very soluble in water, dimethylformamide, aqueous methanol, and 0.1 N HCl; sparingly soluble in absolute ethanol and butanol; and precipitating from the aqueous solution by the addition of a precipating amount of a solution saturated with $NaHCO_3$;

(C) an elemental analysis showing 54.57 percent carbon, 6.19 percent hydrogen, 10.88 percent nitrogen, and 1.37 percent chlorine;

(D) an infrared absorption spectrum in nujol with the following observable absorption maxima: 3290, 2930, and 2860 (nujol), 1765, 1635, 1510, 1455 and 1375 (nujol), 1240, 1175, 1130, 1060, 1015, 975, 840 and 815 cm^{-1};

(E) an ultraviolet absorption spectrum with the following absorption maxima:

(a) in neutral methanol:

234 *nm* ($E^{1\%}_{1cm}$ = 206)

268 *nm* ($E^{1\%}_{1cm}$ = 114)

(b) in methanol containing 0.1 N HCl:

233 *nm* ($E^{1\%}_{1cm}$ = 192)

271 *nm* ($E^{1\%}_{1cm}$ = 93)

(c) in methanol containing 0.1 N NaOH:

251 *nm* ($E^{1\%}_{1cm}$ = 275)

300 *nm* (Shoulder)

(F) a specific rotation $[\alpha]_D^{20}$, of +73±4° (c=0.49, H_2O)

(G) the following R_f values in paper chromatography on Whatman No. 1 paper, using *B. Subtilis* ATCC 6633 as a detection organism:

Elution system (v:v:v)	R_f value
(1) n-butanol saturated with Sorensen buffer pH 6.0	0.00
(2) n-butanol saturated with water containing 2% of p-toluenesulfonic acid	0.00
(3) n-butanol saturated with water containing 2% of ammonium hydroxide	0.00
(4) Sorensen buffer, pH 6.0, saturated with n-butanol	0.05
(5) n-butanol:methanol:water 4:1:2	0.48
(6) ethyl acetate saturated with water	0.00
(7) n-butanol:acetic acid:water 2:1:1	0.44

(H) the following R_f values in the Silicagel thin-layer chromatographic systems indicated below:

Elution system (v:v:v)	R_f value
(1) aqueous 2.5% $HCOONH_4$:CH_3CN 65:35*	0.36
(2) n-butanol:acetic acid:water 4:2:5	0.80
(3) n-butanol:acetic acid:water 4:2:5	0.52
(4) n-propanol:n-butanol:1N NH_4OH 2:3:4 (upper phase)	0.12
(5) n-butanol:acetic acid:water 4:1:5	0.15

1,2 - on silanized Silicagel $60F_{254}$ plates
3,4,5 - on Silicagel $60F_{254}$ plates
*Internal standards: Caffeine R_f 0.60; Cortisone R_f 0.35; Dexamethasone R_f 0.30)

(I) an amino-acid analysis, after acidic hydrolysis in 6 N hydrochloric acid at 110° C. for 6 hours, which indicates the presence of at least the following amino-acids: alanine, leucine, glycine, aspartic acid, phenylalanine, ornithine, p-hydroxyphenylglycine, and hydroxy, chloro-substituted phenylglycine;

(J) a carbohydrate analysis of the acid hydrolyzate after 2 hours in 2 N H_2SO_4 at 100° C. which indicates the presence of D-mannose;

(K) the following characteristic reactions:

Ninhydrin (3% ethanolic solution)	positive
Molish	positive
Biuret	positive
Millon	negative
1% $FeCl_3$-1% $K_3Fe(CN)_6$ aqueous	Green color
$KMnO_4$ (acidic)	positive
H_2SO_4 conc.	negative

and

(L) a retention time (t_R) of 4' 99/100" when analyzed by reverse phase HPLC using an octadecylsilanized silica gel column (3.9 mm ID×300 mm) and a mixture $HCOONH_4$ 0.025 M/CH_3CN 60/40 (v/v) as the mobile phase with a flow rate of 2 ml/min (Internal standards: Anthracene t_R 35' 18/100"; α-Nitronaphthalene t_R 11' 14/100"; Toluene t_R 8' 64/100"), and, in the form of its hydrochloride, by

(M) a melting point of 250° C. (with decomposition).

4,427,657

METHOD FOR TREATMENT OF TRANSPLANTED TUMORS IN MICE

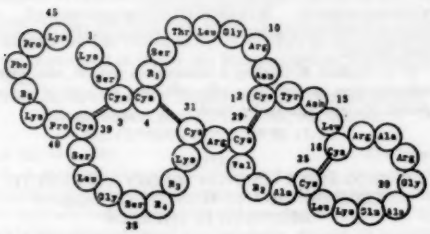
Kunao Toyoshima, Suita; Akira Hakura, Toyonaka; Toshihiro Nakanishi, Ibaraki, and Hajime Yoshizumi, Takatsuki, all of Japan, assignors to Suntory Ltd., Osaka, Japan

Division of Ser. No. 82,657, Oct. 9, 1979, Pat. No. 4,287,185.
This application Jun. 17, 1981, Ser. No. 274,454
Claims priority, application Japan, Oct. 9, 1978, 53-124412
Int. Cl.³ A61K *37/00*
U.S. Cl. 424—177 7 Claims

1. A method for inhibiting transplanted tumor growth in mice comprising:

administering to said mice an effective antitumor amount of a composition comprising:

(a) a polypeptide having the formula:



wherein the symbols "Ala", "Arg", "Asn", "Cys", "Gln", "Gly", "Leu", "Lys", "Phe", "Pro", "Ser", "Thr", "Tyr" and "Val" indicate, respectively, the residues of the levo rotatory forms of alanine, arginine, asparagine, ½ cystine, glutamine, glycine, leucine, lysine, phenylalanine, proline, serine, threonine, tyrosine and valine, and wherein R_1–R_5 indicate (1) the residues of the L-amino acids lysine, asparagine, leucine, threonine and aspartic acid, respectively, or (2) wherein R_1 is arginine, R_2 and R_5 are glycine, R_3 is isoleucine and R_4 is serine, respectively, the symbols " ═ " represent —S—S— bonds and the arabic numerals included in the structural formula near certain amino acid residues constitute the sequence number of said amino acids in turn from the N-terminal and pfiysiologically acceptable salts thereof; and

(b) a pharmaceutically acceptable carrier or diluent.

4,427,658

TOTAL ENZYMATIC HYDROLYSATE FROM WHEY PROTEINS AND PROCESS OF OBTAINING THE SAME

Jean-Louis Maubois, La Barre Guibourg; Loïc Roger, Rennes; Gerard Brule, Rennes, and Michel Piot, Rennes, all of France, assignors to Institut National de la Recherche Agronomique, Paris, France

Continuation of Ser. No. 162,644, Jun. 25, 1980, abandoned.
This application Dec. 9, 1981, Ser. No. 329,000
Claims priority, application France, Jun. 26, 1979, 79 16483
Int. Cl.³ A61K *37/00, 31/195;* A23C *21/00*
U.S. Cl. 424—177 9 Claims

1. A total enzymatic hydrolysate from whey proteins comprising a peptidic hydrolysate containing substantially no residual proteins, at least 50% of the peptides of the peptidic hydrolysate containing 2 to 5 amino acids, the amount of free amino acids being less than 15%.

4,427,659

MURAMYL PEPTIDE SUBSTITUTED ON A PEPTIDE NITROGEN AND MEDICAMENTS CONTAINING THE SAME

Pierre Le Francier, Bures sur Yvette, France; Francoise Audibert, Neuilly sur Seine; Jean Choay; Louis Chedid, both of Paris, and Edgar Lederer, Sceaux, all of France, assignors to Agence Nationale de Valorisation de la Recherche (ANVAR), Neuilly sur Seine, France

Continuation of Ser. No. 123,054, Feb. 20, 1980, abandoned.
This application Jan. 6, 1982, Ser. No. 337,503
Claims priority, application France, Feb. 20, 1979, 7904316
Int. Cl.³ A61K *37/00;* C07C *103/52*
U.S. Cl. 424—177 18 Claims

1. A compound which is selected from the group consisting of N-acetyl-muramyl-L-(N-methyl)-alanyl-D-isoglutamine, the methyl ester of N-acetyl-muramyl-L-(N-methyl)-alanyl-D-isoglutamine and N-acetyl-Nor-muramyl-L-(N-methyl)-alanyl-D-isoglutamine.

4,427,660

FORMYL-METHIONYL CHEMOTATIC PEPTIDE ANTIBIOTIC CONJUGATES USEFUL IN TREATING INFECTIONS

Elliott Schiffman, Chevy Chase, Md., and Leonard C. Altman, Seattle, Wash., assignors to Research Corporation, New York, N.Y.

Filed Mar. 3, 1982, Ser. No. 354,357
Int. Cl.³ A61K *37/00;* C07C *103/52*
U.S. Cl. 424—177 15 Claims

1. An N-formyl peptide-antibiotic complex selected from the group consisting of f-Met-Leu-Phe-R, f-Met-Met-Phe-R, f-Met-Met-Met-R, f-Nle-Leu-Phe-R, f-Met-Leu-Phe-Lys-R, and their pharmaceutically acceptable non-toxic acid addition salts, wherein R is an agent selected from the group consisting of sulfonamide antimicrobial agents, silver containing antimicrobial agents, and antifungal agents.

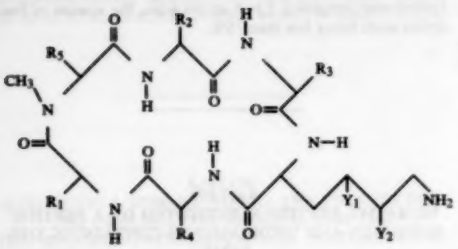
4,427,661

FLUORINATED CYCLIC HEXAPEPTIDE SOMATOSTATIN ANALOGS

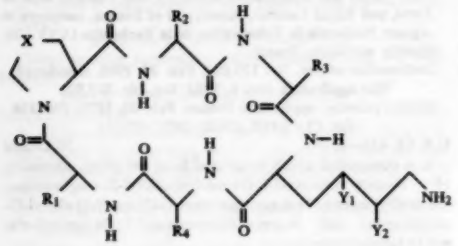
Paul E. Curley, North Wales, and Ralph F. Hirschmann, Blue Bell, both of Pa., assignors to Merck & Co., Inc., Rahway, N.J.

Filed Jul. 30, 1982, Ser. No. 403,942
Int. Cl.³ C07C *103/52;* A61K *37/02*
U.S. Cl. 424—177 9 Claims

1. A compound having the formula:



and



wherein

Y_1 and Y_2 are hydrogen or fluorine provided Y_1 and Y_2 are not the same;

X is $(CH_2)_m$ wherein m is 0, 1, or 2 or sulfur;

R_1 and R_2 are independently lower alkyl, benzyl, substituted benzyl wherein the substituent may be one or two of loweralkyl, halogen, hydroxy, amino, nitro or loweralkoxy; and loweralkyl substituted with a 5 or 6 membered heterocyclic ring;

R_3 is 3-indolylmethyl or substituted 3-indolylmethyl wherein the substituent may be loweralkyl, loweralkoxy or halogen;

R_4 is loweralkyl, hydroxyloweralkyl, benzyl, carboxyloweralkyl, aminoloweralkyl or substituted hydroxy benzyl wherein the substituent may be loweralkyl, loweralkoxy, hydroxy, halogen, amino or nitro, and

R_5 is hydrogen, loweralkyl, benzyl, or substituted benzyl wherein the substituent is loweralkyl, loweralkoxy, hydroxy, halogen, amino or nitro.

4,427,662

3-AMINO-3-DEMETHOXYFORTIMICINS, PHARMACEUTICAL COMPOSITIONS THEREOF AND METHOD OF USE

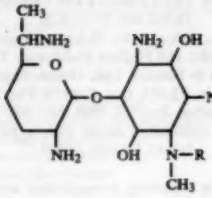
John S. Tadanier, Waukegan, Ill.; Robert Hallas, Kenosha, Wis.; Leslie A. Freiberg, and David J. Bacino, both of Waukegan, Ill., assignors to Abbott Laboratories, North Chicago, Ill.

Filed Apr. 9, 1982, Ser. No. 366,798

Int. Cl.³ A61K *31/71*; C07H *15/22*

U.S. Cl. 424—180 **20 Claims**

1. A 3-amino-3-demethoxyfortimicin compound of the formula:



wherein R is hydrogen, loweralkyl, aminoloweralkyl, diaminoloweralkyl, N-loweralkylaminoloweralkyl, N,N-diloweralkylaminoloweralkyl, hydroxyloweralkyl, aminohydroxyloweralkyl, N-loweralkylaminohydroxyloweralkyl, N,N-diloweralkylaminohydroxyloweralkyl, loweracyl, aminoloweracyl, diaminoloweracyl, hydroxyloweracyl, N-loweralkylaminoloweracyl, N,N-diloweralkylaminoloweracyl, or aminohydroxyloweracyl, and the pharmaceutically acceptable salts thereof.

8. A method of treating a mammalian patient, comprising administering an antibacterially effective amount of a compound of claim **1** to said patient.

4,427,663

4"-KETO-AND 4"-AMINO-4"-DEOXY AVERMECTIN COMPOUNDS AND SUBSTITUTED AMINO DERIVATIVES THEREOF

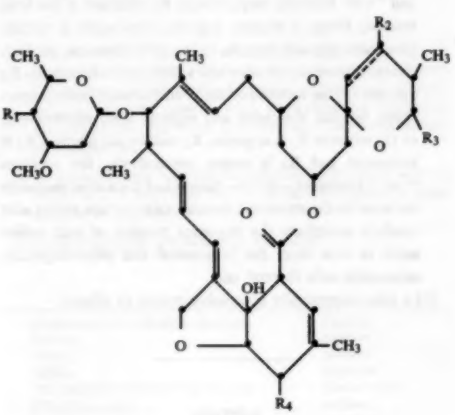
Helmut H. Mrozik, Matawan, N.J., assignor to Merck & Co., Inc., Rahway, N.J.

Filed Mar. 16, 1982, Ser. No. 358,736

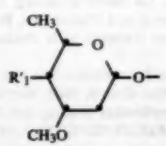
Int. Cl.³ A61K *31/71*; C07H *15/22*

U.S. Cl. 424—180 **14 Claims**

1. A compound having the formula:



wherein R_1 is =O, $-NR_5R_6$ or



wherein

R_1' is =O or $-NR_5R_6$;

R_5 and R_6 are independently hydrogen, loweralkyl, loweralkanoyl, substituted benzenesulfonyl wherein the substituent is halogen; or loweralkyl sulfonyl;
R_2 is hydrogen or hydroxy;
R_3 is sec-butyl or iso-propyl;
R_4 is hydroxy or methoxy;
and the broken line indicates a single or a double bond at the 22,23-position provided that R_2 can only be hydroxy when the broken line indicates a single bond.

13. A method for the treatment of helminthiasis which comprises administering to an animal infected with helminths an effective amount of a compound of claim **1**.

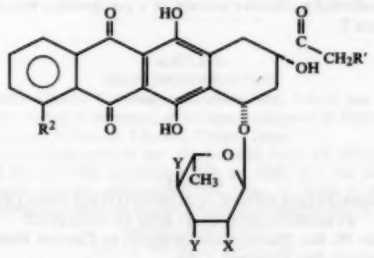
4,427,664

2'HALO DERIVATIVES OF DAUNOMYCIN, DESMETHOXY DAUNOMYCIN, ADRIAMYCIN AND CARMINOMYCIN

Derek Horton, and Waldemar Priebe, both of Columbus, Ohio, assignors to The United States of America as represented by the Department of Health and Human Services, Washington, D.C.

Continuation of Ser. No. 268,623, May 29, 1981, abandoned. This application Aug. 17, 1982, Ser. No. 408,942
Int. Cl.³ A61K *31/71;* **C07H** *15/24*
U.S. Cl. 424—180 **12 Claims**

8. A method of treating murine leukemia in mice which comprises injecting a mouse infected with P388 leukemia with a biologically palliative amount and in a dosage regimen of up to 22 days of a compound selected from



(1) R′ = H; R^2 = OMe; X; Y
(2) R′ = OH; R^2 = OMe; X; Y
(3) R′ = H; R^2 = H; X; Y
(4) R′ = H; R^2 = OH; X; Y
where: X = I, Cl, Br, or F; and Y = OH or AcO(acetoxy)

(1) R′=H; R^2=OMe; X; Y
(2) R′=OH; R^2=OMe; X; Y
(3) R′=H; R^2=H; X; Y
(4) R′=H; R^2=OH; X; Y
where:
X=I, Cl, Br, or F; and
Y=OH or AcO (acetoxy).

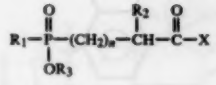
4,427,665

PHOSPHINYLALKANOYL SUBSTITUTED IMINO ACIDS AND THEIR USE IN HYPOTENSIVE COMPOSITIONS

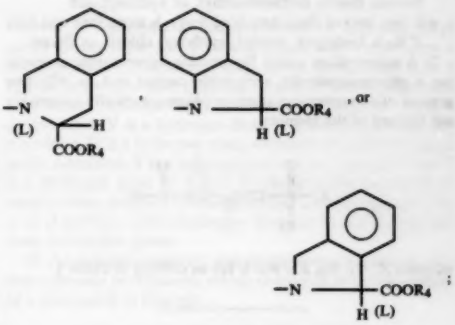
Donald S. Karanewsky, Princeton Junction, and Edward W. Petrillo, Jr., Pennington, both of N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed May 19, 1982, Ser. No. 379,678
Int. Cl.³ A61K *31/675;* **C07F** *9/32*
U.S. Cl. 424—200 **9 Claims**

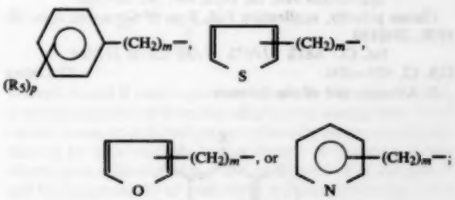
1. A compound of the formula



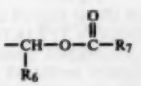
and a pharmaceutically acceptable salt thereof wherein X is



R_1 is straight or branched chain alkyl of 1 to 10 carbons, halo substituted lower alkyl wherein lower alkyl is straight or branched chain of 1 to 7 carbons, cycloalkyl-$(CH_2)_m$— wherein cycloalkyl is a saturated ring of 3 to 7 carbon atoms,



R_2 is hydrogen, straight or branched chain lower alkyl of 1 to 7 carbons, halo substituted lower alkyl wherein lower alkyl is straight or branched chain of 1 to 7 carbons, benzyl, or phenethyl;
R_3 and R_4 are independently selected from the group consisting of hydrogen, straight or branched chain lower alkyl of 1 to 7 carbons, benzyl, benzhydryl, and



wherein R_6 is hydrogen, straight or branched chain alkyl of 1 to 10 carbons, cycloalkyl which is a saturated ring of 3 to 7 carbon atoms, or phenyl, and R_7 is hydrogen, straight or branched chain alkyl of 1 to 10 carbons, cycloalkyl which is a saturated ring of 3 to 7 carbon atoms, lower alkoxy of 1 to 7 carbons, phenyl, benzyl, phenethyl, or R_6 and R_7 taken together are —$(CH_2)_2$—, —$(CH_2)_3$—, —CH=CH—, or

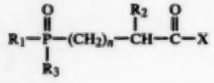
n is zero to one;

m is zero or an integer from 1 to 7;

R_5 is hydrogen, lower alkyl of 1 to 4 carbons, lower alkoxy of 1 to 4 carbons, lower alkylthio of 1 to 4 carbons, chloro, bromo, fluoro, trifluoromethyl, or hydroxy; and

p is one, two or three provided that p is more than one only if R_5 is hydrogen, methyl, methoxy, chloro, or fluoro.

7. A composition useful for treating hypertension comprising a pharmaceutically acceptable carrier and an effective amount of a hypotensive agent or pharmaceutically acceptable salt thereof of the formula



wherein X, R_1, R_2, R_3, and n are as defined in claim **1**.

4,427,666

3,5-DIHALOGENO-1,2-METHYLENEDIOXYBENZENE ARTHROPODICIDE SYNERGIZING AGENTS

Volker Mues, Wuppertal, and Wolfgang Behrenz, Overath, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

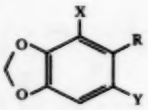
Continuation of Ser. No. 24,747, Mar. 28, 1979, abandoned. This application Jun. 15, 1982, Ser. No. 388,566

Claims priority, application Fed. Rep. of Germany, Apr. 14, 1978, 2816190

Int. Cl.³ A61K *31/675, 31/36;* **C07D** *317/44*

U.S. Cl. 424—200 **17 Claims**

2. A compound of the formula



in which

R is hydrogen, alkyl, alkenyl or alkynyl of of up 4 carbon atoms, optionally substituted with chlorine, or alkanoyl or alkanoyloxy each with up to 4 carbon atoms, phenethyl, cyano or a radical of the formula

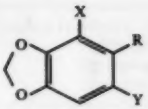
wherein

R^{16} is hydrogen or methyl,

R^{17} is hydrogen, alkyl with 1 to 5 carbon atoms, allyl, propargyl or benzyl, and

X and Y each independently is fluorine, chlorine, bromine or iodine, but X and Y are not both bromine if R is hydrogen or unsubstituted alkyl.

14. An arthropodicidal composition containing as active ingredients (1) at least one compound of the formula



in which

R is hydrogen, alkyl, alkenyl or alkynyl of up to 4 carbon atoms, optionally substituted with chlorine, or alkanoyl or alkanoyloxy each with up to 4 carbon atoms, phenethyl, cyano or a radical of the formula

wherein

R^{16} is hydrogen or methyl,

R^{17} is hydrogen, alkyl with 1 to 5 carbon atoms, allyl, propargyl or benzyl, and

X and Y each independently is fluorine, chlorine, bromine or iodine, but X and Y are not both bromine if R is hydrogen or unsubstituted alkyl, and (2) an arthropodicidally effective amount of at least one compound selected from the group consisting of (A) carbamates, (B) carboxylic acid esters (C) phosphoric acid esters and (D) halogenoalkanes.

16. A method of combating arthropods which comprises applying to the arthropods, or to a habitat thereof, an arthropodicidally effective amount of a composition according to claim **2**.

4,427,667

2,2-BIS(HALOALKENYL)-1-SUBSTITUTED-1-DIALKOXYPHOSPHOROETHYLENE FUNGICIDES

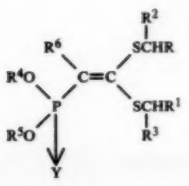
Andrew W. Ho, Pinole, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Mar. 25, 1982, Ser. No. 361,651

Int. Cl.³ A01N *57/18*

U.S. Cl. 424—210 **15 Claims**

1. A compound having the formula:



(I)

wherein

R and R^1 are independently lower alkenyl or lower alkenyl substituted with 1 to 3 of the same or different halogens;

R^2 and R^3 are independently hydrogen or lower alkyl;

R^4 and R^5 are independently lower alkyl;

R^6 is cyano or —$COOR^7$ wherein R^7 is lower alkyl; and

Y is oxygen or sulfur.

2. A method for controlling fungi which comprises applying to the fungus or its habitat a fungicidally effective amount of the compound of the formula defined in claim **1**.

4,427,668

26-HYDROXYCHOLESTEROL AND DERIVATIVES AND ANALOGS THEREOF IN REGULATION OF CHOLESTEROL ACCUMULATION IN BODY TISSUE

Norman B. Javitt, New York, N.Y., assignor to New York University, New York, N.Y.

Filed Apr. 1, 1982, Ser. No. 364,338
Int. Cl.³ A61K 31/56
U.S. Cl. 424—238 15 Claims

1. A process for reducing the rate of cholesterol synthesis by a human which comprises administering to said human a cholesterol synthesis rate-reducing amount of 26-hydroxycholesterol or a fatty acid ester, a sulfate, a carbonate of a glucuronide thereof.

4,427,669

CONTRACEPTIVE

Charles A. Blake, and Jorge F. Rodriguez-Sierra, both of Omaha, Nebr., assignors to The Board of Regents of the University of Nebraska, Lincoln, Nebr.

Filed Jun. 28, 1982, Ser. No. 392,556
Int. Cl.³ A01N 45/00
U.S. Cl. 424—238 7 Claims

1. A method of contraception of a female mammal comprising the steps of:

mixing 2-hydroxyestradiol in a vehicle for preventing oxidation of the 2-hydroxyestradiol; and

administering by subcutaneous injection at least 0.5 micrograms of the 2-hydroxyestradiol to the female for each 100 grams of body weight of the female on at least two consecutive days.

4,427,670

SKIN PREPARATION

Kunihiko Ofuchi, Yokohama; Koichiro Oda, Tokyo, and Kenichiro Nakao, Yokohama, all of Japan, assignors to Mitsubishi Chemical Industries Limited, Tokyo, Japan

Continuation-in-part of Ser. No. 243,430, Mar. 13, 1981, Pat. No. 4,333,927. This application Feb. 10, 1982, Ser. No. 347,557
Claims priority, application Japan, Mar. 27, 1980, 55-39450
The portion of the term of this patent subsequent to Jun. 8, 1997, has been disclaimed.
Int. Cl.³ A61K 31/58, 31/56
U.S. Cl. 424—241 1 Claim

1. A skin preparation containing at least one topical corticosteroid selected from the group consisting of diflucortolone valerate, diflucortolone pivalate, flucortin butyl, fluocortolone, clocortolone pivalate, halcinonide, amcinonide, diflorasone diacetate, desoxymethasone, difluprednate, desonide, budesonide, prednisone, paramethasone, fludroxycortide and flunisolide, and an effective amount of a phosphatide and at least one of butylhydroxyanisole and butylhydroxytoluene to impart stability to the preparation for a prolonged period.

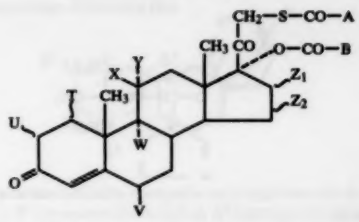
4,427,671

STEROIDS ESTERIFIED IN POSITION 17 AND THIOESTERIFIED IN POSITION 21, A PROCESS FOR PREPARING THEM AND THEIR USE AS MEDICAMENTS

Dieran R. Torossian, Bourg-la-Reine; Gilbert G. Aubard, Palaiseau; Claude P. Roux, Paris, and Agnes G. Grouhel, Meudon, all of France, assignors to S.I.P.S.Y., Avrille, France

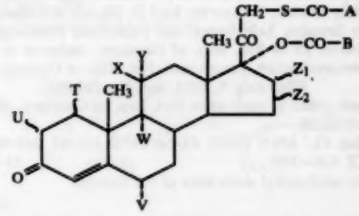
Filed Jul. 13, 1982, Ser. No. 397,715
Claims priority, application France, Jul. 30, 1981, 81 14860
Int. Cl.³ A61K 31/56; C07J 7/00
U.S. Cl. 424—243 24 Claims

1. A compound of formula:



wherein A represents a straight-chained or branched alkyl group having from 1 to 6 carbon atoms and B represents a straight-chained or branched alkyl group having from 1 to 6 carbon atoms or a phenyl group, T and U, independently of each other, represent hydrogen atoms or together form a double bond, V is a hydrogen atom or a methyl group at the α-position, W is a hydrogen atom, a fluorine or a chlorine atom at the α-position, X is a hydroxy group at the β-position and Y is a hydrogen atom or X and Y may together represent an oxygen atom, and Z_1 is a hydrogen atom, a methyl group at the α- or β-position, Z_2 is a hydrogen atom, or Z_1 and Z_2 together form a methylen group.

19. An anti-inflammatory, anti-pruriginous, anti-allergic and anti-asthmatic medicament, which comprises an active amount of a compound of formula:



wherein A and B each represent, independently of each other, a straight-chained or branched alkyl group having from 1 to 6 carbon atoms or a phenyl group optionally mono- or polysubstituted by alkyl radicals having from 1 to 6 carbon atoms, alkoxy groups having form 1 to 6 carbon atoms or halogen, T and U, independently of each other, represent hydrogen atoms or together form a double bond, V is a hydrogen atom or a methyl group at the α-position, W is a hydrogen atom or a halogen atom at the α-position, X is a hydroxy group at the β-position and Y is a hydrogen atom or X and Y may together represent an oxygen atom, and Z_1 is a hydrogen atom, a methyl group at the α- or β-position, whilst Z_2 is a hydrogen atom, or Z_1 and Z_2 together form a methylene group in admixture with pharmaceutically acceptable vehicle.

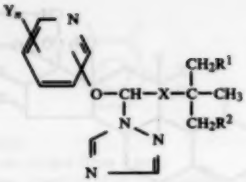
4,427,672

COMBATING FUNGI WITH SUBSTITUTED TRIAZOLYLALKYL PYRIDYL ETHERS

Udo Kraatz, Leverkusen; Jörg Stetter, Wuppertal; Karl H. Büchel, Burscheid; Paul-Ernst Frohberger, Leverkusen, and Wilhelm Brandes, Leichlingen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Jul. 9, 1981, Ser. No. 281,628
Claims priority, application Fed. Rep. of Germany, Jul. 29, 1980, 3028669
Int. Cl.³ A01N 43/64, 59/16; C07D 401/12; C07F 1/08
U.S. Cl. 424—245 10 Claims

1. A substituted triazolylalkyl pyridyl ether of the formula



in which

R^1 is a halogen atom,

R^2 is hydrogen or halogen atom,

X is a keto group or a CH(OH) group,

Y each independently is a halogen atom, an alkyl or alkoxy group with 1 to 4 carbon atoms, or a cyano group, and

n is 0, 1, 2, 3 or 4,

or an addition product thereof with a physiologically acceptable acid or metal salt.

8. A fungicidal composition comprising a fungicidally effective amount of a compound according to claim **1** in admixture with a diluent.

4,427,673

AZOLYLALKYL KETONE AND ALCOHOL FUNGICIDES

Wolfgang Krämer, Wuppertal; Karl H. Büchel, Burscheid; Wilhelm Brandes, Leichlingen, and Paul-Ernst Frohberger, Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

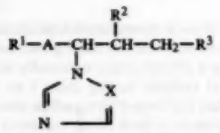
Filed Aug. 7, 1981, Ser. No. 291,003

Claims priority, application Fed. Rep. of Germany, Aug. 27, 1980, 3032326

Int. Cl.[3] **A01N** *43/50, 43/64;* **C07D** *233/61, 249/08*

U.S. Cl. 424—245 **15 Claims**

1. An azolylalkyl derivative of the formula



in which

R^1 is an alkyl group with 1 to 4 carbon atoms or optionally substituted phenyl or naphthyl group,

R^2 is an optionally substituted phenyl or naphthyl group,

R^3 is a cyano group or a —CO—OR^4 group, and

R^4 is an alkyl group with 1 to 4 carbon atoms or an optionally substituted phenylalkyl or naphthylalkyl group with 1 or 2 carbon atoms in the alkyl part,

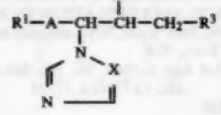
the optional substituent(s) of R^1 and/or R^2 and/or R^4 being independently selected from halogen, alkyl with 1 to 4 carbon atoms, halogenalkyl with 1 or 2 carbon atoms and 1 to 5 identical or different halogen atoms, alkoxy and alkylthio with in each case 1 or 2 carbon atoms, and phenyl,

A is a keto group or a CH(OH) group, and

X is a nitrogen atom or the CH group, or a physiologically acceptable addition product thereof with an acid or a metal salt.

2. A fungicidal composition comprising a fungicidally effective amount of a compound or addition product according to claim **1** in admixture with a diluent.

4. An azolylalkyl derivative of the formula



in which

R^1 is an alkyl group with 1 to 4 carbon atoms,

R^2 is a hydrogen atom, an alkyl group with 1 to 4 carbon atoms or an optionally substituted phenyl or naphthyl group,

R^3 is a cyano group or a —CO—OR^4 group, and

R^4 is an alkyl group with 1 to 4 carbon atoms or an optionally substituted phenylalkyl or naphthylalkyl group with 1 or 2 carbon atoms in the alkyl part,

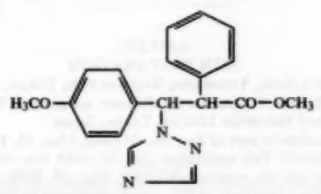
the optional substituent(s) of R^2 and/or R^4 being independently selected from halogen, alkyl with 1 to 4 carbon atoms, halogenoalkyl with 1 or 2 carbon atoms and 1 to 5 identical or different halogen atoms, alkoxy and alkylthio with in each case 1 or 2 carbon atoms, and phenyl,

A is a keto group or a CH(OH) group, and

X is a nitrogen atom or the CH group, or a physiologically acceptable addition product thereof with an acid or a metal salt.

10. A fungicidal composition comprising a fungicidally effective amount of a compound or addition product according to claim **4** in admixture with a diluent.

13. 3-(4-Methoxyphenyl)-2-phenyl-3-(1,2,4-triazol-1-yl)propionic acid methyl ester of the formula



or a physiologically acceptable addition product thereof with an acid or a metal salt.

4,427,674

CEPHEM COMPOUNDS

Takao Takaya, Kawanishi; Hisashi Takasugi, Kohamanishi; Kiyoshi Tsuji, Osaka, and Toshiyuki Chiba, Nara, all of Japan, assignors to Fujisawa Pharmaceutical Co., Ltd., Osaka, Japan

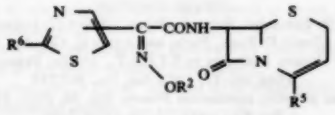
Division of Ser. No. 886,340, Mar. 14, 1978. This application Sep. 15, 1981, Ser. No. 302,668

Claims priority, application United Kingdom, Mar. 14, 1977, 10699/77; Jul. 12, 1977, 29245/77; Oct. 11, 1977, 42315/77; Jan. 3, 1978, 75/78

Int. Cl.[3] **C07D** *501/22;* **A61K** *31/545*

U.S. Cl. 424—246 **44 Claims**

1. A syn compound of the formula



wherein

R^2 is C_1 to C_8 alkyl,

R^5 is carboxy or pharmaceutically acceptable esterified carboxy and R^6 is amino or protected amino, and pharmaceutically acceptable salt thereof.

4,427,675

CEPHALOSPORIN ANTIBIOTICS

Barry E. Ayres, Ickenham; Cynthia H. O'Callaghan, Gerrards Cross; David G. H. Livermore, Princes Risborough, and Christopher E. Newall, London, all of England, assignors to Glaxo Group Limited, London, England

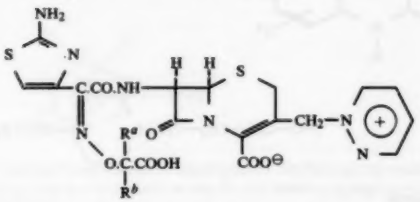
Continuation of Ser. No. 193,844, Oct. 3, 1980, abandoned, which is a continuation of Ser. No. 123,566, Feb. 22, 1980, abandoned. This application Sep. 29, 1981, Ser. No. 306,729

Claims priority, application United Kingdom, Feb. 23, 1979, 7906478; Feb. 23, 1979, 7906479

Int. Cl.³ C07D *501/38;* A61K *31/545*

U.S. Cl. 424—246 9 Claims

1. A cephalosporin antibiotic selected from the group consisting of compounds of formula:



(I)

wherein R^a and R^b, which may be the same or different, each represents a C_{1-4} alkyl group, or together with the carbon atom to which they are attached form a C_{3-7} cycloalkylidene group and non-toxic salts thereof.

4,427,676

THIOMORPHOLINE DERIVATIVES

Alan C. White, Windsor, and Michael M. Hann, Maidenhead, both of England, assignors to John Wyeth & Brother Ltd., Maidenhead, England

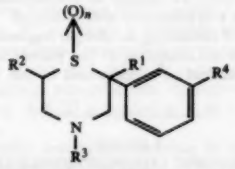
Filed Dec. 14, 1981, Ser. No. 330,618

Claims priority, application United Kingdom, Dec. 19, 1980, 8040826

Int. Cl.³ C07D *279/12;* A61K *31/54*

U.S. Cl. 424—246 17 Claims

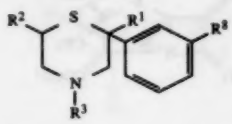
1. A compound selected from the group consisting of a thiomorpholine of formula (I)



(I)

and a pharmaceutically acceptable acid addition salt thereof, wherein n represents 0 or 1, R^1 represents (lower)alkyl, R^2 represents hydrogen or (lower)alkyl, R^3 represents hydrogen, lower alkyl, lower alkenyl, lower alkynyl, phenyl(lower)alkyl, 2-tetrahydrofurylmethyl or cycloalkylmethyl and R^4 represents hydrogen, hydroxy, lower alkanoyloxy, lower alkoxy, benzyloxy, or (lower)alkoxymethoxy, with the proviso that when n is 0, R^4 is other than hydrogen.

17. A method of treating a mammal in need of an analgesic or opiate antagonist which comprises administering to said mammal an analgesically or opiate antagonistically effective amount of a compound selected from the group consisting of a thiomorpholine of formula (Ia)



(Ia)

and a pharmaceutically acceptable acid addition salt thereof, wherein R^1 represents (lower)alkyl, R^2 represents hydrogen or (lower)alkyl, R^3 represents hydrogen, lower alkyl, lower alkenyl, lower alkynyl, phenyl(lower)alkyl, 2-tetrahydrofurylmethyl or cycloalkylmethyl and R^8 represents hydroxy, lower alkanoyloxy or lower alkoxy.

4,427,677

CEPHEM COMPOUNDS

Takao Takaya, Kawanishi; Hisashi Takasugi, Hamaguchinishi; Masayoshi Murata, Osaka, and Akiteru Yoshioka, Kyoto, all of Japan, assignors to Fujisawa Pharmaceutical Co., Ltd., Osaka, Japan

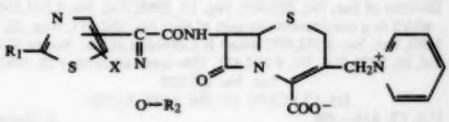
Filed Dec. 21, 1981, Ser. No. 332,830

Claims priority, application United Kingdom, Dec. 31, 1980, 8041639; Jul. 13, 1981, 8121557

Int. Cl.³ C07D *501/46;* A61K *31/545*

U.S. Cl. 424—246 6 Claims

1. A compound of the formula:



wherein

R_1 is amino, lower alkanoylamino or halo(lower)alkanoylamino,

R_2 is lower alkyl, lower alkylthio(lower)alkyl, lower alkenyl, lower alkynyl, carboxy(lower)alkyl or esterified carboxy(lower)alkyl, and

X is halogen;

and pharmaceutically acceptable salts thereof.

4,427,678

6-AMINOMETHYLPENICILLANIC ACID 1,1-DIOXIDE DERIVATIVES AS BETA-LACTAMASE INHIBITORS

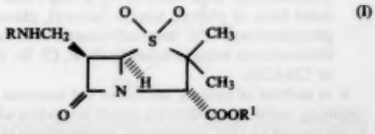
Wayne E. Barth, East Lyme, Conn., assignor to Pfizer Inc., New York, N.Y.

Continuation-in-part of Ser. No. 338,797, Jan. 11, 1982, abandoned. This application Jun. 14, 1982, Ser. No. 388,323

Int. Cl.³ A61K *31/545, 31/43;* C07D *499/00*

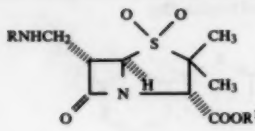
U.S. Cl. 424—246 23 Claims

1. A compound having the stereochemical formula



(I)

or



(II)

wherein

R is benzyl,

o-, m- or p-hydroxybenzyl, phenethyl, or

2-, 3- or 4-picolyl; and

R^1 is hydrogen, or

a radical group forming an ester which is hydrolyzable under physiological conditions;

a pharmaceutically-acceptable acid addition salt thereof or a pharmaceutically-acceptable cationic salt thereof when R^1 is hydrogen.

10. A pharmaceutical composition for treating bacterial infections which comprises, in a weight ratio of 1:3 to 3:1, a compound of claim **1** and a beta-lactam antibiotic in amounts which are effective in the treatment of bacterial infections.

4,427,679

HEXAHYDRO-TRANS- AND TETRAHYDROPYRIDOINDOLE NEUROLEPTIC AGENTS

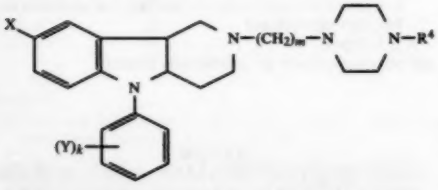
Willard M. Welch, Mystic, and Charles A. Harbert, Waterford, both of Conn., assignors to Pfizer Inc., New York, N.Y.

Division of Ser. No. 259,569, Jan. 16, 1981, Pat. No. 4,337,250, which is a continuation-in-part of Ser. No. 182,177, Aug. 28, 1980, Pat. No. 4,352,807, which is a division of Ser. No. 61,573, Jul. 30, 1979, Pat. No. 4,252,811. This application May 20, 1982, Ser. No. 379,826

Int. Cl.[3] **C07D** *487/04;* **A61K** *31/495*

U.S. Cl. 424—250 **8 Claims**

1. A (+) enantiomeric, a mixture of (+) and (−) enantiomeric or (±) racemic 4a,9b-trans-hexahydro-1H-pyridoindole derivative of the formula



or a pharmaceutically acceptable salt thereof, wherein

k is 1 or 2;

m is 2 to 6;

X and Y are each independently H, F, Cl, Br, OCH_3, CH_3 or CH_2CH_3;

R^4 is H, (C_1–C_5)alkyl, phenyl, benzyl, (C_1–C_8) alkanoyl, (C_2–C_8)alkoxycarbonyl, benzoyl, phenylacetyl, (C_1–C_8-)alkylsulfonyl, phenylsulfonyl or a ring mono or disubstituted form of phenyl, benzyl, benzoyl, phenylacetyl, or phenylsulfonyl, the monosubstituent and each of the disubstituents being independently F, Cl, Br, OCH_3, CH_3 or CH_2CH_3.

8. A method of treating psychoses and neuroses in a patient requiring major tranquilization which comprises administering to the patient by oral, intravenous, intramuscular or subcutaneous route an effective amount of a compound of claim **1**.

4,427,680

1,2-DIHYDROQUINOLINES CONNECTED VIA AN OXYALKYL GROUP WITH A PIPERIDINE RING AND HAVING ANTI-ALLERGIC ACTION

Walter-Gunar Friebe, Darmstadt; Werner Winter, Heppenheim; Max Thiel; Androniki Roesch, both of Mannheim, and Otto-Henning Wilhelms, Weinheim-Rittenweier, all of Fed. Rep. of Germany, assignors to Boehringer Mannheim GmbH, Mannheim, Fed. Rep. of Germany

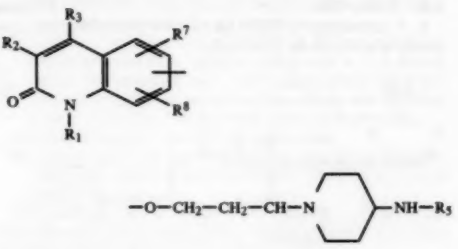
Division of Ser. No. 104,205, Dec. 17, 1979, Pat. No. 4,330,549. This application Feb. 8, 1982, Ser. No. 346,790

Claims priority, application Fed. Rep. of Germany, Jan. 15, 1979, 2901336

Int. Cl.[3] **A61K** *31/47;* **C07D** *215/22, 401/12*

U.S. Cl. 424—258 **5 Claims**

1. An aryl ether derivative of the formula



wherein

R_1 is a hydrogen atom or a lower alkyl radical,

R_2 and R_3 each independently is a hydrogen atom or lower alkyl radical,

R_5 is a hydrogen atom or a lower alkanoyl radical optionally substituted by halogen, aryl or benzthiazole derivatives; a lower alkenoyl radical optionally substituted by aryl; an aroyl, furancarbonyl, thiophenecarbonyl or pyridinecarbonyl radical optionally substituted by halogen, hydroxyl, lower alkyl, lower alkoxy, lower alkoxycarbonyl, lower alkanoyloxy, carboxyl, nitro, amino, nitrile, trifluoromethyl, carbamoyl or benzyl; a C_{3-7}-cycloalkylcarboxylic acid radical, a benzenesulphonic acid radical; or a lower alkyl sulphonic acid radical,

R_7 is a hydrogen atom, a lower alkyl radical or a lower alkanoyl radical, and

R_8 is a hydrogen atom, a lower alkyl radical, a lower alkoxy radical or a hydroxyl group;

or a pharmacologically acceptable salt thereof.

3. An anti-allergic composition of matter comprising an anti-allergically effective amount of a compound or salt according to claim **1** in admixture with a diluent.

4. A method of combating an allergic response in a patient which comprises administering to the patient an antiallergically effective amount of a compound or salt according to claim **1**.

4,427,681

THIXOTROPIC COMPOSITIONS EASILY CONVERTIBLE TO POURABLE LIQUIDS

Mayank V. Munshi, E. Norwalk, Conn., assignor to Richardson-Vicks, Inc., Phillipsburg, N.J.

Filed Sep. 16, 1982, Ser. No. 419,022

Int. Cl.[3] **A61K** *31/485, 47/00*

U.S. Cl. 424—260 **16 Claims**

1. An aqueous vehicle composition comprising water and (a) from about 1% to about 3% weight/volume of a suspendeding agent consisting of about 89% weight microcrystalline cellulose gel blended with about 11 weight percent sodium carboxymethylcellulose, and (b) from about 0.01% to about 0.5% weight/volume titanium dioxide, which composition is a thixo-

tropic gel on standing but is easily convertable to a pourable liquid upon moderate shaking for about five seconds.

4,427,682

PYRIDINE ALKYL BENZOIC AND THENOIC ACID COMPOUNDS AND THEIR PHARMACEUTICAL COMPOSITIONS

Tadao Tanouchi, Takatsuki; Masanori Kawamura, Ibaraki, and Masaki Havashi, Takatsuki, all of Japan, assignors to Ono Pharmaceutical Co., Ltd., Osaka and Kissei Pharmaceutical Co., Ltd., Nagano, both of, Japan

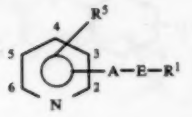
Division of Ser. No. 233,703, Feb. 12, 1981, Pat. No. 4,317,828, which is a division of Ser. No. 105,672, Dec. 20, 1979, Pat. No. 4,271,170. This application Dec. 11, 1981, Ser. No. 329,891

Claims priority, application Japan, Dec. 28, 1978, 53-161996; Aug. 7, 1979, 54-100377

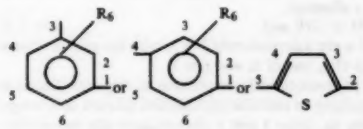
Int. Cl.[3] **A61K** *31/54; C07C 213/55*

U.S. Cl. 424—263 **14 Claims**

1. A pyridine derivative of the general formula (I):



wherein A represents an unsubstituted alkylene group containing from 1 to 5 carbon atoms, E represents a grouping of the formula:



in which R^6 represents a hydrogen atom, or an alkyl group containing from 1 to 4 carbon atoms, R^1 represents a grouping of the formula: —$COOR^4$ or —$COSR^4$ in which R^4 represents a hydrogen atom, or an alkyl group containing from 1 to 12 carbon atoms, or an aralkyl group containing from 7 to 13 carbon atoms, or a cycloalkyl group containing from 4 to 7 carbon atoms unsubstituted or substituted by at least one alkyl group containing from 1 to 4 carbon atoms, or a phenyl group unsubstituted or substituted by at least one of a halogen atom, a trifluoromethyl group, an alkyl or alkoxy or alkylthio group, each containing from 1 to 4 carbon atoms, a nitro group or a phenyl group, R^5 represents a hydrogen atom, or an alkyl group containing from 1 to 4 carbon atoms, and non-toxic acid addition salts thereof and, when R^1 represents a carboxy or thiocarboxy group, non-toxic salts thereof, with the proviso that the group -A-E-R^1 is bonded to 3- or 4- position of the pyridine ring.

13. A pyridine derivative according to claim **1** which is 4-[2-(3-pyridylethyl)]benzoic acid.

4,427,683

ANTIINFLAMMATORY-2'-PYRIDYL-1'-OXIDE CARBOTHIOLATE AND CARBODITHIOATE COMPOUNDS

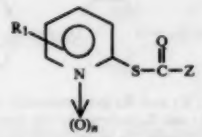
James M. Gullo, Perry, Ohio, assignor to SDS Biotech Corporation, Painesville, Ohio

Filed Mar. 22, 1982, Ser. No. 360,216

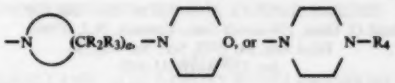
Int. Cl.[3] **A61K** *31/44, 31/445;* **C07D** *401/12*

U.S. Cl. 424—263 **11 Claims**

1. A compound of the formula

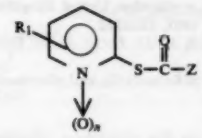


or a pharmaceutically acceptable nontoxic salt thereof wherein R_1 is hydrogen, alkyl, halogen or alkoxy, n is 1, Q is sulfur or oxygen and Z represents

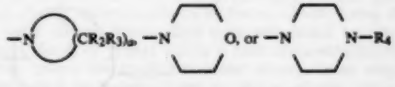


where a is 4–6 and R_2, R_3 and R_4 independently represent hydrogen or alkyl; wherein the terms alkyl and alkoxy as used herein are inclusive of straight and branch chain carbon-carbon linkages and represent 1 to 5 carbon atoms.

4. A pharmaceutical antiinflammatory composition in dosage unit form comprised of an inert pharmaceutical carrier and an active ingredient, the active ingredient of which consists of a nontoxic antiinflammatory effective amount of a compound of the formula:

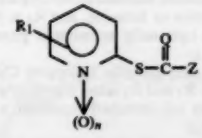


or a pharmaceutically acceptable nontoxic salt thereof wherein R_1 is hydrogen, alkyl, halogen or alkoxy, n is 1, Q is sulfur or oxygen and Z represents NR_5R_6.

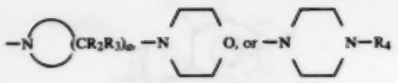


where a is 4–6, R_2 R_3 and R_4 independently represent hydrogen or alkyl and R_5 and R_6 independently represent hydrogen, alkyl or phenyl; wherein the terms alkyl and alkoxy as used herein as inclusive of straight and branch chain carbon-carbon linkages and represent 1 to 5 carbon atoms.

8. A method of obtaining an antiinflammatory effect in a mammal in need thereof comprising administering thereto an antiinflammatory effective amount of a compound of the formula:



or a pharmaceutically acceptable nontoxic salt thereof wherein R_1 is hydrogen, alkyl, halogen or alkoxy, n is 1, Q is sulfur or oxygen and Z represents



where a is 4–6, R_2 R_3 and R_4 independently represent hydrogen or alkyl and R_5 and R_6 independently represent hydrogen, alkyl or phenyl; wherein the terms alkyl and alkoxy as used herein are inclusive of straight and branch chain carbon-carbon linkages and represent 1 to 5 carbon atoms.

4,427,684

TREATMENT AND PREVENTION OF INFECTION WITH HERPES SIMPLEX AND RELATED VIRUSES

Richard O. Ores, 194 Larch Ave., Teaneck, N.J. 07666

Filed Sep. 24, 1982, Ser. No. 423,233

Int. Cl.³ A61K *31/445*

U.S. Cl. 424—267 **9 Claims**

1. A method of treating herpetic infections which comprises the topical administration of an anti-herpetic effective amount of cycloheximide to an individual in need of such treatment.

4,427,685

CYCLOALKYLAMINO DERIVATIVES AND THEIR USE IN THE TREATMENT OF PEPTIC ULCERS AND THE LIKE

Geoffrey Stemp, Sawbridgeworth, England, assignor to Beecham Group P.L.C., England

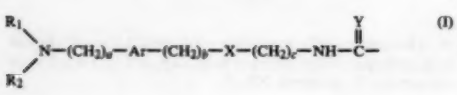
Filed Feb. 3, 1982, Ser. No. 345,424

Claims priority, application United Kingdom, Feb. 9, 1981, 8103844; Nov. 21, 1981, 8135162

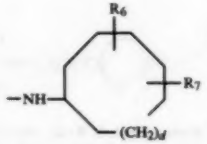
Int. Cl.³ A61K *31/13, 31/34, 31/38;* **C07D** *307/52*

U.S. Cl. 424—267 **9 Claims**

1. A compound of formula (I), and pharmaceutically acceptable salts thereof:



(I)



wherein:

a is 1 to 3;

b is 0 to 2:

c is 2 to 4;

d is 1 to 5;

X is sulphur, oxygen or $—CH_2—$;

Y is oxygen, sulphur, NR_4 or CHR_5 wherein R_4 is hydrogen, C_{1-4} alkyl, NO_2 or CN, C_{1-4} alkylsulphonyl or phenylsulphonyl optionally substituted in the phenyl moiety by one or two substituents selected from C_{1-4} alkyl, C_{1-4} alkoxy, fluorine, chlorine or bromine, and R_5 is NO_2, C_{1-4} alkylsulphonyl or optionally substituted phenylsulphonyl as defined for R_4;

R_1 and R_2 are independently hydrogen, C_{1-4} alkyl, or C_{3-6} cycloalkyl; or R_1 and R_2 taken together with the nitrogen to which they are attached represent a pyrrolidino or piperidino ring;

R_6 and R_7 are independently hydrogen or C_{1-6} alkyl; and

Ar is furan or thiophene attached at positions 2- and 5- or benzene attached at positions 1- and 3- or 1- and 4-.

9. A method of treating disorders caused or exacerbated by excess gastric acid secretion in mammals, including humans, which method comprises administering an effective amount of a compound according to claim **1** or a pharmaceutically acceptable salt thereof to the sufferer.

4,427,686

PHARMACOLOGICALLY ACTIVE BENZOPYRANOTRIAZOLE COMPOUNDS

Derek R. Buckle, Redhill, and Harry Smith, Maplehurst Nr Horsham, both of England, assignors to Beecham Group Limited, England

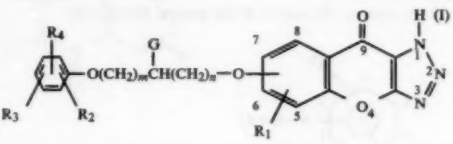
Filed Dec. 8, 1981, Ser. No. 328,732

Claims priority, application United Kingdom, Dec. 13, 1980, 8040020; Mar. 26, 1981, 8109551

Int. Cl.³ A61K *31/41;* **C07D** *491/052*

U.S. Cl. 424—269 **11 Claims**

1. A compound of formula (I):



(I)

or a pharmaceutically acceptable salt thereof,

wherein

R_1 is hydrogen or C_{1-6} alkyl;

R_2, R_3 and R_4 are the same or different and are chosen from hydrogen, hydroxyl, halogen, C_{1-4} alkyl, C_{1-4} alkoxy and C_{1-4} alkanoyl;

G is H or OH; and

m and n are independently 1 to 3; with the proviso that when G is OH, one of m and n is 1.

10. A pharmaceutical composition having anti-allergic activity comprising an anti-allergic effective amount of a compound according to, claim **1** and a pharmaceutically acceptable carrier.

4,427,687

THIAZOLINE CARBAMOYL-OXIMES

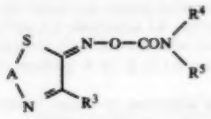
Christoph Lüthy, Schwerzenbach, and Paul Winternitz, Greifensee, both of Switzerland, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Filed Apr. 24, 1981, Ser. No. 257,072

Int. Cl.³ C07D *277/08;* **A61K** *31/425*

U.S. Cl. 424—270 **34 Claims**

1. A compound of the formula



I

wherein A is a group (a)

(a)

R^1 and R^2 are hydrogen, lower alkyl or cycloalkyl containing 3 to 6 carbon atoms, or together with the carbon atom to which they are attached a 4- to 8-membered, saturated hydrocarbon ring,

R^3 is hydrogen, lower alkyl or cycloalkyl containing 3 to 6 carbon atoms,

R^4 is hydrogen

and

R^5 is lower alkyl, lower alkenyl or cycloalkyl containing 3 to 6 carbon atoms,

or

R^4 is lower alkyl

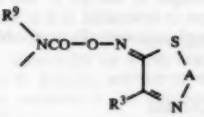
and

R^5 is lower alkyl, lower alkylcarbonyl, tri(lower alkyl)silyl or a group (c)

$$-S_m-R^6 \quad (c)$$

R^6 is alkyl; lower haloalkyl, phenyl, phenyl substituted with halogen, lower alkyl and/or trifluoromethyl; or a group (d) or (e)

$$-NR^7R^8 \quad (d)$$


(e)

R^7 and R^8 are lower alkyl or lower haloalkyl, or together with the nitrogen atom to which they are attached a piperidino or morpholino group,

R^9 is lower alkyl

and

m is 1 or 2.

4,427,688

N-SUBSTITUTED 2-METHYLNAPHTHYLAMIDES, THEIR PREPARATION, AND THEIR USE FOR CONTROLLING FUNGI

Costin Rentzea, Heidelberg; Bernd Zeeh; Eberhard Ammermann, both of Ludwigshafen; Gerhard Hamprecht, Weinheim, and Ernst-Heinrich Pommer, Limburgerhof, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

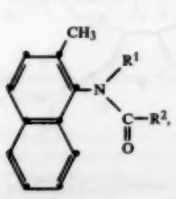
Filed May 13, 1982, Ser. No. 377,968

Claims priority, application Fed. Rep. of Germany, May 25, 1981, 3120804

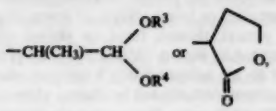
Int. Cl.[3] **A61K** *31/38;* **C07D** *275/02*

U.S. Cl. 424—270 **3 Claims**

2. A process for combating fungi, wherein the fungi or the objects to be protected against fungus attack are treated with a fungicidally effective amount of an N-substituted 2-methylnaphthylamide of the formula


(I)

where R^1 is $-CH(CH_3)-COOCH_3$,



where R^3 and R^4 independently of one another or are methyl or ethyl, or R^3 and R^4 together are alkylene of 2 or 3 carbon atoms which is unsubstituted or substituted by methyl or ethyl, and R^2 is a 5-membered heterocyclic ring in which the ring atoms consist of one sulfur atom and one or two nitrogen atoms and is unsubstituted or mono-substituted by methyl, ethyl, bromine, chlorine or nitro or disubstituted by one methyl group and one chlorine atom.

4,427,689

CLAVULANIC ACID 9-DEOXY-9-THIA DERIVATIVES THEIR PREPARATION AND USE

Iskander L. Zomaya, Worcester Park, and John S. Davies, Reigate, both of England, assignors to Beecham Group Limited, England

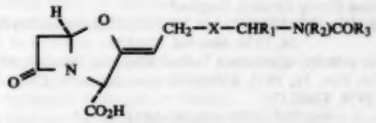
Filed Aug. 31, 1979, Ser. No. 71,731

Claims priority, application United Kingdom, Sep. 5, 1978, 35642/78

Int. Cl.[3] **C07D** *498/04;* **A61K** *31/42, 31/545, 31/43*

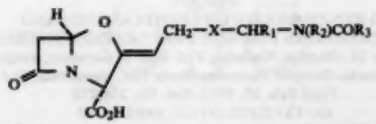
U.S. Cl. 424—272 **89 Claims**

1. A compound of the formula (I):


(I)

or a pharmaceutically acceptable salt or pharmaceutically acceptable ester thereof wherein R_1 is hydrogen, lower alkyl, phenyl, thienyl, furyl, phenyl mono-substituted by fluoro, chloro, lower alkyl or lower alkoxy, or lower alkyl mono-substituted by phenyl, thienyl, furyl, or phenyl which is itself mono-substituted by fluoro, chloro, lower alkyl or lower alkoxy, R_2 and R_3 are independently hydrogen, phenyl, thienyl, furyl, phenyl mono-substituted by fluoro, chloro, lower alkyl or lower alkoxy, lower alkyl mono-substituted by phenyl, thienyl, furyl, or phenyl which is itself mono-substituted by fluoro, chloro, lower alkyl or lower alkoxy, lower alkyl or lower alkyl mono-substituted by lower alkoxy, phenoxy, thienyloxy, furyloxy, phenoxy mono-substituted by fluoro, chloro, lower alkyl or lower alkoxy, carboxylic acid, a pharmaceutically acceptable carboxyl salt, a carboxylic acid lower alkyl ester, a carboxylic acid lower alkyl mono-substituted by phenyl, thienyl, furyl, or phenyl which is itself mono-substituted by fluoro, chloro, lower alkyl or lower alkoxy ester, amino or phenyl, thienyl, furyl, phenyl mono-substituted by fluoro, chloro, lower alkyl or lower alkoxy, and X is S,SO or SO_2 and wherein lower alkyl is alkyl of 1 to 6 carbon atoms.

29. A pharmaceutical composition useful for treating bacterial infections in mammals including humans which comprises an antibacterially effective amount of a compound of the formula (I):


(I)

or a pharmaceutically acceptable salt or pharmaceutically

acceptable ester thereof wherein Ris hydrogen, lower alkyl, phenyl, thienyl, furyl, phenyl mono-substituted by fluoro, chloro, lower alkyl or lower alkoxy, or lower alkyl mono-substituted by phenyl, thienyl, furyl, or phenyl which is itself mono-substituted by fluoro, chloro, lower alkyl or lower alkoxy, R_2 and R_3 are independently hydrogen, phenyl, thienyl, furyl, phenyl mono-substituted by fluoro, chloro, lower alkyl or lower alkoxy, lower alkyl mono-substituted by phenyl, thienyl, furyl, or phenyl which is itself mono-substituted by fluoro, chloro, lower alkyl or lower alkoxy, lower alkyl or lower alkyl mono-substituted by lower alkoxy, phenoxy, thienyloxy, furyloxy, phenoxy mono-substituted by fluoro, chloro, lower alkyl or lower alkoxy, carboxylic acid, a pharmaceutically acceptable carboxyl salt, a carboxylic acid lower alkyl ester, a carboxylic acid lower alkyl mono-substituted by phenyl, thienyl, furyl, or phenyl which is itself mono-substituted by fluoro, chloro, lower alkyl or lower alkoxy ester, amino or phenyl, thienyl, furyl, phenyl mon-substituted by fluoro, chloro, lower alkyl or lower alkoxy, and X is S,SO or SO_2 and wherein lower alkyl is alkyl of 1 to 6 carbon atoms, in combination with a pharmaceutically acceptable carrier.

4,427,690

ESTERS OF CLAVULANIC ACID

Martin Cole, Dorking; Thomas T. Howarth, Ellens Green, and Christopher Reading, Southwater, all of England, assignors to Beecham Group Limited, England

Division of Ser. No. 569,007, Apr. 17, 1975. This application Sep. 24, 1976, Ser. No. 726,224

Claims priority, application United Kingdom, Apr. 20, 1974, 17410/74; Dec. 11, 1974, 53525/74; Jun. 21, 1974, 27715/74; Oct. 9, 1974, 43651/74

Int. Cl.³ C07D *498/04*; A61K *31/42*

U.S. Cl. 424—272 **211 Claims**

2. A pharmaceutically composition useful for treating bacterial infections in humans and animals which comprises an anti-bacterially effective amount of a pharmaceutically acceptable clavulanic acid ester selected from the group consisting of methyl, ethyl, n-propyl, iso-propyl, straight or branched butyl, pentyl, heptyl, octyl, nonyl, decyl, undecyl, dodecyl, vinyl, allyl, butenyl, cyclopropyl, cyclobutyl, cyclohexyl, cycloheptyl, cyclohexenyl, cyclohexadienyl, methylcyclopentyl, methylcyclohexyl, benzyl, benzhydryl, phenylethyl, naphthylmethyl, phenyl, naphthyl, propynyl, tolyl, 2-chlorenthyl, 2,2,2-trichloroethyl, 2,2,2-trifluoroethyl, acetylmethyl, benzoylmethyl, 2-methoxyethyl, 2-dimethylaminoethyl, 2-diethylaminoetihyl, 2-piperidinoethyl, 2-morpholinoethyl, 3-dimethylaminopropyl, p-chlorobenzyl, p-methoxybenzyl, p-nitrobenzyl, p-bromobenzyl, m-chlorobenzyl, 6-methoxynaphthyl-2-methyl, p-chlorophenyl and p-methoxyphenyl ester of clavulanic acid, in combination with a pharmaceutically acceptable carrier.

11. A β-lactamase inhibitory ester of clavulanic acid.

4,427,691

1,2-BENZISOXAZOLOXYETHYLAMINES AND INTERMEDIATES FOR THE PREPARATION THEREOF

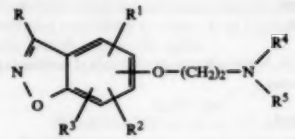
Gregory M. Shutske, Nauheim, Fed. Rep. of Germany, assignor to Hoechst-Roussel Pharmaceuticals Inc., Somerville, N.J.

Filed Feb. 25, 1981, Ser. No. 238,276

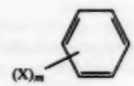
Int. Cl.³ C07D *261/20*; A61K *31/42*

U.S. Cl. 424—272 **7 Claims**

1. A compound of the formula



wherein R is



wherein X is hydrogen, halogen, loweralkyl of 1 to 6 carbon atoms, loweralkoxy of 1 to 6 carbon atoms, loweralkylthio of 1 to 6 carbon atoms or trifluoromethyl; R^1, R^2 and R^3 are each independently hydrogen, halogen or methyl; R^4 and R^5 are each independently hydrogen or loweralkyl of 1 to 6 carbon atoms; m is 1, 2 or 3; and the pharmaceutically acceptable acid addition salts thereof.

4,427,692

AGGLOMERATED HALO-HYDANTOINS

Theodore A. Girard, Williamsport, Pa., assignor to Glyco, Inc., Williamsport, Pa.

Continuation of Ser. No. 331,062, Dec. 15, 1981, abandoned. This application Apr. 6, 1983, Ser. No. 481,018

Int. Cl.³ A01N *43/50*

U.S. Cl. 424—273 R **13 Claims**

1. In a process for the formation of spherical agglomerates which comprises feeding a finely divided material to an agglomerating disc which is characterized as a flat, disc having baffles positioned above the surface thereof and a rim circumscribing the edge thereof, the improvement which comprises feeding a mixture of 5,5-dimethylhydantoin and a dihalodimethylhydantoin together with a spray of water to the surface of said disc in a rotating state so as to form spherical agglomerates of the mixture having to a moisture content of 30% or less, and thereafter drying the spherical agglomerates.

4,427,693

ANTIINFLAMMATORY 4,5-DIARYL-α,α-BIS (POLYHALOMETHYL)-2-THIOPHENEMETHANAMINES

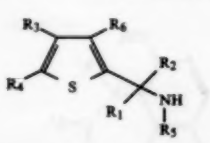
Stephen B. Haber, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 288,994, Aug. 5, 1981, abandoned, which is a continuation-in-part of Ser. No. 220,772, Dec. 29, 1980, abandoned. This application Nov. 2, 1981, Ser. No. 316,661

Int. Cl.³ A61K *31/38, 31/44*; C07D *333/00, 401/00*

U.S. Cl. 424—275 **33 Claims**

1. A compound of the formula

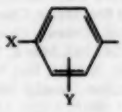


(I)

where

R_1 and R_2 independently=CF_3, CF_2H, $CFCl_2$, CF_2Cl, CClFH or CCl_2H;

R_3 and R_4 independently=pyridyl or



where

X=H, F, Cl, Br, NO_2, C_1–C_2 alkyl, OR_7, $—N(R_7)_2$ or $R_7S(O)_n$; where

n=0, 1 or 2;

Y=H, F or Cl with the proviso that when Y is F or Cl, then X is F, Cl or H;

R_5=H or alkyl of 1–3 carbons;

R_6=H or alkyl of 1–3 carbons; and

R_7=alkyl of 1–2 carbons;

or a pharmaceutically suitable acid addition salt thereof.

4,427,694

SESAMIN AS A PSYCHOTROPIC AGENT

Herman P. Benecke, and Bob E. Sherwood, both of Columbus, Ohio, assignors to The Vinoxen Company, Inc., Stamford, Conn.

Filed Jun. 11, 1982, Ser. No. 387,638

Int. Cl.³ A61K *31/36*

U.S. Cl. 424—282 **16 Claims**

1. A method for producing a psychotropic response in a human or animal subject suffering from a condition for which a psychotropic response would be therapeutic, comprising administering to said subject a psychotropically effective non-toxic amount of sesamin.

4,427,695

COMPOSITIONS OF ASYMMETRIC DIPHENYL ORGANOTINS AND USE FOR CONTROL OF PLANT DISEASES

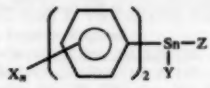
Robert J. Ehr, Pittsburg, Pa., assignor to The Dow Chemical Company, Midland, Mich.

Continuation of Ser. No. 270,423, Jun. 4, 1981, abandoned, which is a continuation-in-part of Ser. No. 195,277, Oct. 8, 1980, abandoned. This application Aug. 5, 1982, Ser. No. 405,474

Int. Cl.³ A01N *55/04*

U.S. Cl. 424—288 **14 Claims**

1. The method of controlling grape downy mildew which comprises applying at least a fungicidally effective amount but less than a phytotoxic amount to said grape plants of an organotin compound of the following formula:



wherein:

each X is independently halogen, C_1–C_4 alkyl, haloalkyl, $—OCH_3$ or $—SCH_3$;

n is 0, 1 or 2;

Y is straight or branched chain C_1–C_{12} alkyl, C_3–C_7 cycloalkyl, C_3–C_8 carboalkoxyalkyl, cyanoalkyl, hydroxyalkyl, alkylamido or lower alkylphenyl, the lower alkyl in each having 1 to 4 carbon atoms;

and

Z is halogen, hydroxide, O/2, lower alkanoate or tosylate.

4,427,696

FUNGICIDAL ACYL ANILIDES

Adolf Hubele, Magden, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Division of Ser. No. 101,355, Dec. 7, 1979, Pat. No. 4,194,850, which is a division of Ser. No. 923,604, Jul. 11, 1978, Pat. No. 4,206,228, which is a division of Ser. No. 723,826, Sep. 16, 1976, Pat. No. 4,151,299, which is a continuation of Ser. No. 565,037, Apr. 4, 1975, abandoned. This application Jun. 15, 1981, Ser. No. 274,019

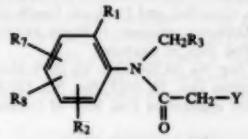
Claims priority, application Switzerland, Apr. 9, 1974, 4995/74; Mar. 14, 1975, 3259/75

The portion of the term of this patent subsequent to Apr. 24, 1996, has been disclaimed.

Int. Cl.³ A01N *37/10*; C07C *149/43*

U.S. Cl. 424—309 **13 Claims**

1. A method of combatting phytopathogenic fungi which comprises apply thereto a fungicidally effective amount of a compound of the formula



wherein

R_1 represents alkyl of 1 to 4 carbon atoms, alkoxy of 1 to 4 carbon atoms or halogen,

R_2 represents hydrogen, alkyl of 1 to 3 carbon atoms, alkoxy of 1 to 4 carbon atoms, or halogen,

R_7 represents hydrogen, alkyl of 1 to 3 carbon atoms, alkoxy of 1 to 4 carbon atoms, or halogen,

R_8 represents hydrogen or methyl,

the total number of carbon atoms of the substituents R_1, R_2, R_7 and R_8 not exceeding 8,

R_3 represents —COOR′ in which R′ represents hydrogen, methyl or ethyl, and

Y represents —O—R_4, in which R_4 represents alkyl of 1 to 6 carbon atoms, alkenyl of 3 to 6 carbon atoms, alkynyl of 3 to 6 carbon atoms, each of them unsubstituted or substituted by a halogen atom, or R_4 represents benzyl or phenyl which independently may be unsubstituted or substituted by halogen or alkyl of 1 to 4 carbon atoms.

9. The compound N-(methoxycarbonyl-methyl)-N-methoxyacetyl-2,6-dichloroaniline.

4,427,697

1,2-DIPHENYLETHANE DERIVATIVES

Rosalind P. K. Chan, London, England, assignor to Biorex Laboratories Limited, England

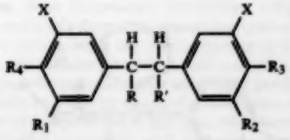
Filed Nov. 16, 1981, Ser. No. 321,931

Claims priority, application United Kingdom, Nov. 18, 1980, 8036921

Int. Cl.³ C07C *39/16, 49/813, 69/21*; A61K *31/055, 31/05, 31/12, 31/22*

U.S. Cl. 424—311 **8 Claims**

1. 1,2-Diphenylethane derivatives of the general formula:



wherein X is a hydrogen or fluorine atom, R is a methyl or ethyl radical, R′ is a methyl, ethyl or 2,2,2-trifluoroethyl radi-

cal, R_1 and R_2 which are the same or different, are hydroxyl groups or acetyl radicals and R_3 and R_4, which are the same or different, are hydroxyl, methoxy or acetoxy, with the proviso that, when X is a hydrogen R' is 2,2,2-trifluoroethyl.

8. The pharmaceutical composition for administration to a human requiring anti-oestrogenic therapy, containing at least one compound according to claim 1 in an anti-oestrogenically effective amount, in admixture with a solid or liquid pharmaceutical diluent or carrier.

4,427,698

USE OF N,N-DIMETHYL-N'-P-TOLYL-N'-DICHLORO-FLUOROMETHYLTHIO-SULPHAMIDE FOR COMBATING FUNGI WHICH DAMAGE WOOD

Engelbert Kühle, Bergisch-Gladbach; Wilfried Paulus, Krefeld; Erich Klauke, Odenthal, and Hermann Genth, Krefeld, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Continuation of Ser. No. 83,504, Oct. 10, 1979, abandoned. This application Dec. 15, 1981, Ser. No. 330,983

Claims priority, application Fed. Rep. of Germany, Oct. 13, 1978, 2844605

Int. Cl.³ A61K *31/18*

U.S. Cl. 424—321 9 Claims

1. A process for combating fungi in wood which comprised contacting said wood with 0.35 to 3.5 parts by weight of N,N-dimethyl-N'-p-tolyl-N'-dichlorofluoromethylthio-sulphamide per part by weight wood.

4,427,699

IMIDOYL THIOUREAS AS USED TO CONTROL TOBACCO BUDWORM

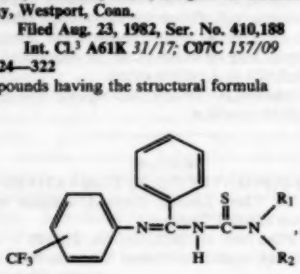
David L. Lee, Martinez, Calif., assignor to Stauffer Chemical Company, Westport, Conn.

Filed Aug. 23, 1982, Ser. No. 410,188

Int. Cl.³ A61K *31/17*; C07C *157/09*

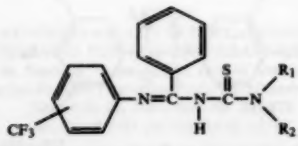
U.S. Cl. 424—322 9 Claims

1. Compounds having the structural formula



wherein R_1 is hydrogen or C_1–C_4 alkyl, and R_2 is C_1–C_4 alkyl.

8. The method of controlling tobacco budworm comprising applying to the habitat thereof an effective amount of a compound of the formula



wherein R_1 is hydrogen or C_1–C_4 alkyl, and R_2 is C_1–C_4 alkyl.

4,427,700

REPELLENT FOR BLACK FLY

Arthur Retnakaran, Sault Ste. Marie, Canada, assignor to Canadian Patents & Dev. Ltd., Ottawa, Canada

Continuation of Ser. No. 147,964, May 8, 1980, abandoned. This application Dec. 3, 1981, Ser. No. 327,250

Claims priority, application Canada, Jul. 18, 1979, 332067

Int. Cl.³ A01N *37/18*, *35/00*

U.S. Cl. 424—324 8 Claims

1. An insect repellent composition particularly for black flies, comprising:

(a) N,N-diethyl-m-toluamide and

(b) vanillin,

the vanillin being present in proportion by weight relative to toluamide (a) ranging from about 1:5 up to about 1:2.

4,427,701

FROZEN YOGURT PRODUCT

Robert G. Morley, Stone Mountain, Ga., assignor to Landwide Foods, Inc., Dover, Mass.

Continuation-in-part of Ser. No. 210,846, Nov. 26, 1980, Pat. No. 4,346,120. This application Jun. 1, 1982, Ser. No. 383,767

Int. Cl.³ A23G *9/02*, *9/04*; A23C *9/123*, *9/13*

U.S. Cl. 426—36 18 Claims

1. A frozen yogurt product

A. characterized at least in part by being extrudable and coneable at near 0° F. for serving by extrusion at home freezer temperatures,

B. consisting essentially, by weight in the absence of significant weight by flavorings, of

(1) edible triglycerides in a range from 0% to 5%,

(2) protein in a range from 4% to 5.5%,

(3) water in a range of 50% to 60%,

(4) added saccharides in a range from 22% to 30% and including plural saccharides selected from the group consisting of sorbitol, fructose, dextrose, corn syrup, mannitol and sucrose,

(5) stabilizers in a range from 0.25% to 1.3% and including at least a first stabilizer selected from the group consisting of guar gum, locust bean gum, tara gum, propylene glycol alginate, sodium carboxymethyl cellulose, and other cellulose ethers; a second stabilizer selected from the group consisting of microcrystalline cellulose and cellulose fibers; and a third stabilizer selected from the group consisting of gelatin, xanthan gum, carrageenan, pectin and sodium alginate,

(6) emulsifiers in a range from 0.45% to 0.775% and including at least a first emulsifier selected from the group consisting of mono- and diglycerides and distilled monoglycerides, and a second emulsifier selected from the group consisting of polysorbate 65, polysorbate 80, and ethoxylated monoglycerides, and

(7) yogurt culturing means for converting the product to yogurt; and

C. having a specific gravity in the range of between 0.36 and 0.54.

4,427,702

ICE CREAM SCOOP ASSEMBLY

John L. Andrews, 1711 Knoll, Houston, Tex. 77080

Filed May 10, 1982, Ser. No. 376,849

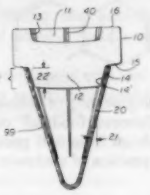
Int. Cl.³ A23G *9/00*

U.S. Cl. 426—101 3 Claims

1. An ice cream cone assembly comprising:

a cone with an apex angulated internal surface having a plurality of V-shaped grooves which communicate with a plurality of angulated teeth coincidingly located in a scoop seating area of an ice cream scoop; and

an ice cream scoop having at its lower end an angulated guide with a scoop seating area the said guide having a



plurality of teeth which communicate with said grooves located in said cone.

4,427,703

CONFECTIONERY ARTICLES, AND APPARATUS AND PROCESSES FOR PRODUCING THEM

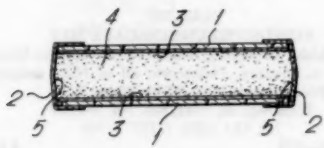
Georg Schäfer, Heppenheim, Fed. Rep. of Germany; Eberhard Schulz, Perchtoldsdorf, Austria, and Otto Schulz, Lautertal, Fed. Rep. of Germany, assignors to Thomas J. Lipton, Inc., Englewood Cliffs, N.J.

Filed Oct. 5, 1981, Ser. No. 308,880

Claims priority, application United Kingdom, Oct. 3, 1980, 8032037

Int. Cl.³ A23G *3/00, 9/00, 9/24*

U.S. Cl. 426—101 31 Claims



1. An improved composite ice confection product comprising an open-ended hollow wafer container lined with an internal fat-based confection lining, an ice confection filling within the container, a continuous capping of fat-based confection covering the open end of the wafer container and overlapping the adjacent portion of the outside surface of the wafer container, the capping being continuous with the internal fat-based confection lining.

4,427,704

FOOD PRODUCT THICKENED OR GELLED WITH CARRAGEENAN AND GLUCOMANNAN

Peter A. Cheney, Anstey; John Stares, Melton Mowbray, both of England, and Alan J. Vernon, Brea, Calif., assignors to Mars Limited, London, England

Continuation-in-part of Ser. No. 138,726, Apr. 9, 1980, abandoned, and Ser. No. 310,281, Oct. 9, 1981, abandoned. This application Jan. 20, 1982, Ser. No. 341,008

Claims priority, application United Kingdom, Apr. 11, 1979, 7912816; Oct. 9, 1980, 8032684

Int. Cl.³ A23G *1/00*

U.S. Cl. 426—104 27 Claims

1. A food product having a pH not higher than 8 comprising a gelled aqueous phase and at least one other food material, said gelled phase comprising 0.01 to 5 percent by weight of a mixture or reaction product of at least one glucomannan and at least one carrageenan in a ratio of glucomannan to carrageenan from 20:1 to 1:20.

4,427,705

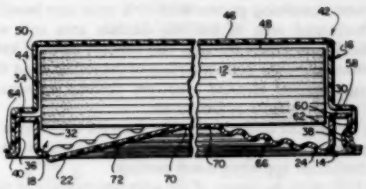
COMMESTIBLE PACKAGE

Ibor Wyslotsky, and Erich Hoffmann, both of Alsip, Ill., assignors to TEC, Inc., Alsip, Ill.

Filed May 15, 1981, Ser. No. 263,872

Int. Cl.³ B65D *6/02*

U.S. Cl. 426—106 22 Claims



1. In an evacuated package containing a comestible having a longitudinal dimension, said package having a top member, said top member including a generally planar cover portion for covering the top of the comestible, and a base member for engaging said top member, said base member having a bottom portion for supporting the comestible, the improvement comprising:

a plurality of integrally formed congruent corrugations disposed about at least the periphery of said base member bottom portion, to permit said bottom portion to flex to accommodate variances in the longitudinal dimension of the comestible to be contained by the package; and

at least one tacking corrugation disposed radially across and connecting said congruent corrugations for urging said congruent corrugations upwardly to form a spring-like bottom structure for urging the top of the comestible into substantial proximity to the planar cover portion for more prominent display of the comestible.

4,427,706

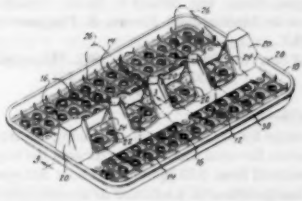
METHOD FOR HEATING PAR-FRIED, BATTER-COATED FROZEN FOODS

Nabil A. El-Hag, Lake Peekskill, N.Y., assignor to General Foods Corporation, White Plains, N.Y.

Filed Mar. 16, 1981, Ser. No. 244,431

Int. Cl.³ A23L *1/01*

U.S. Cl. 426—243 12 Claims



1. A method of heating, in an oven, batter-coated and par-fried, frozen, three dimensional comestibles, which method produces a uniformly deep-fried appearance and crisp texture of the batter coating while the interior portion of the comestible is moist and sufficiently cooked, said method comprising:

(a) orienting vertically the batter-coated and par-fried frozen comestible on a tray by means of spaced-apart, upstanding support elements affixed to said tray, said elements fixedly engaging the comestible, and said elements containing apertures, said tray having a plurality of apertures distributed over its surface and said tray having a surface which

consists of an ovenable, nonmetallic material which will absorb liquids in such a manner that no portion of the comestible remains in contact with free liquid;

(b) placing the tray and vertically oriented comestible into said oven;

(c) heating the oven whereby heated air passes through the tray apertures and around all surfaces of the comestible in order to convectively heat the comestible, said tray apertures containing greater than 10% open area based on the horizontal area of the tray surface area and wherein heated air passes through said support element apertures from below the bottom surface of the tray and out through said support element apertures thereby enhancing the convective flow of heated air;

(d) heating the comestible in the oven for a time effective to produce an appetizing batter-coated product having a deep-fried appearance and coating;

(e) collecting, by means of the adsorbent surface of the tray, the liquids which are released from the comestible during oven heating, said tray containing upwardly-projecting rims around each of the apertures so that substantially no liquids will pass through the apertures in the tray.

4,427,707

METHOD FOR THE PRODUCTION OF FOOD ADDITIVES WITH IMPROVED TASTE

Christian Heine, Monheim, and Reinhold Wüst, Kaarst, both of Fed. Rep. of Germany, assignors to Henkel KGaA, Fed. Rep. of Germany

Filed Mar. 25, 1982, Ser. No. 361,781

Claims priority, application Fed. Rep. of Germany, Apr. 11, 1981, 3114783

Int. Cl.³ A23L *1/20*; A23G *1/00*

U.S. Cl. 426—312 **2 Claims**

1. A method of improving the taste and odor characteristics of a powder selected from the group consisting of locust bean pods, locust bean gum and guar gum comprising drying, and powdering and roasting a member of the group consisting of locust bean pods, locust bean gum and guar gum and extracting the powder at elevated pressures with liquid carbon dioxide at its supercritical temperatures.

4,427,708

USE OF CYCLOHEXENYL-ALPHA-ALKYL ACROLEIN DERIVATIVES IN AUGMENTING OR ENHANCING THE AROMA OR TASTE OF FOODSTUFFS

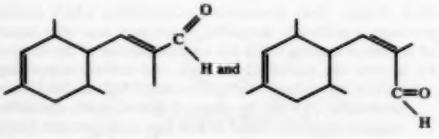
Mark A. Sprecker, Sea Bright, N.J.; Philip T. Klemarczyk, Newington, Conn., and Robert P. Belko, Woodbridge, N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

Division of Ser. No. 398,953, Jul. 16, 1982. This application Jun. 16, 1983, Ser. No. 505,421

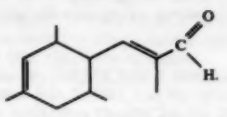
Int. Cl.³ A23L *1/226*

U.S. Cl. 426—538 **2 Claims**

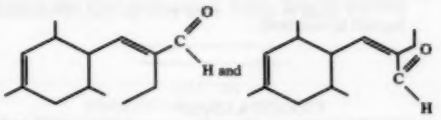
1. A process for augmenting or enhancing the aroma or taste of a cinnamon flavored foodstuff comprising the step of adding to said foodstuff from 0.02 ppm up to about 500 ppm based on the total composition of a mixture of compounds having the structures:



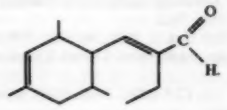
with the majority of the mixture being the compound having the structure:



2. A process for augmenting or enhancing the aroma or taste of a leafy-green flavored foodstuff comprising the step of adding to said foodstuff from 0.02 ppm up to about 500 ppm based on total composition of a mixture of compounds having the structures:



with the majority of the mixture being the compound having the structure:



4,427,709

POWDERED CHEESECAKE MIX

Thomas E. Guhl, Jamesburg; Ralph E. Kenyon, Belle Mead, and Patricia A. Mozeke, Plainsboro, all of N.J., assignors to General Foods Corporation, White Plains, N.Y.

Filed Sep. 30, 1981, Ser. No. 307,353

Int. Cl.³ A23L *1/187, 1/195*

U.S. Cl. 426—578 **4 Claims**

1. A dry, hydratable cheesecake mix which when combined with milk and mixed at a low mixer speed will yield a short, dense texture and when mixed a high mixer speed will yield a short, light texture, said dry mix containing flavor and bulking agents, powdered cheese, powdered fat, pregelatinized, amylose-containing starch, and phosphate gelling agents, said mix having a fat content of from 8% to 25% by weight and an amylose content of from 0.05% to 1.4% by weight and wherein said mix further contains propylene glycol monostearate at a level of 0.4% to 1.0% by weight and in an amount which is effective to shorten the slimy texture produced by the amylose and which amount is at least 15% by weight of the amylose present in the mix.

4,427,710

METHOD OF MANUFACTURING AN INSTANT BEAN CURD OR TOFU, AND THE TOJU MADE BY SUCH METHOD

Masaki Terada, Ohtsu; Akihiro Yoshimura, Kitanakakohji; Kohichiro Hohsai, Ibaraki, and Junichi Minami, Tondabayashi, all of Japan, assignors to Nissin Shokuhin Kabushiki Kaisha, Osaka, Japan

Filed Dec. 23, 1981, Ser. No. 333,755

Int. Cl.³ A23L *1/20*

U.S. Cl. 426—634 **10 Claims**

1. A method for manufacturing an easy-to-prepare instant tofu comprising the following steps in sequence:

(a) soaking a quantity of soybeans in water whereby said soybeans become swollen with water;

(b) grinding a portion of the moisture-laden soybeans to a size smaller than 50μ;

(c) heating the ground soybean material to a temperature in the range 90° C. to 100° C. for a period of about one to ten minutes;

(d) drying and powdering said ground soybean material whereby the dried powder has a particle size less than 50μ;

(e) admixing a thickening agent with said dried powder; and

(f) adding water and a gelatinizing agent for gelatinizing said thickening agent to form tofu.

4,427,711

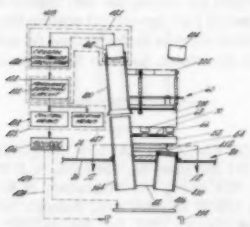
A METHOD FOR SENSING DEPOSITION OF A THIN FILM LAYER OF A MATERIAL

Richard T. Martin, Santa Barbara, Calif., assignor to Applied Magnetics Corporation, Goleta, Calif.

Division of Ser. No. 267,038, May 26, 1981, which is a continuation-in-part of Ser. No. 232,842, Feb. 9, 1981, Pat. No. 4,373,470. This application Sep. 13, 1982, Ser. No. 417,679

Int. Cl.³ C23C *13/00*

U.S. Cl. 427—10 **4 Claims**



1. A method of measuring at least one of a mass per unit area, thickness or deposition rate of a thin film material applied to a substrate through a deposition mask selected from a plurality of deposition masks adapted to be individually positioned along a deposition path between a substrate and a source comprising the steps of

forming a plurality of predetermined monitoring apertures in a carriage means adjacent each of said plurality of deposition masks supported thereby wherein each predetermined monitoring aperture is adapted to pass therethrough a predetermined portion of a said thin film material which is the same as that passed from a thin film material source through a selected deposition mask positioned between a said source of thin film material and a said substrate;

selectively inhibiting the passage of a predetermined portion of a said thin film material through a selected number of said plurality of said monitoring apertures;

passing at least one of said plurality of predetermined portions of a said thin film material along at least one of a plurality of associated predetermined paths;

positioning a plurality of detecting means one each along each of said predetermined paths such that a selected one of said plurality of detecting means is positioned along a selected one of said plurality of predetermined paths for sensing the predetermined quantity of material being passed along its associated predetermined path; and

producing with a circuit means responsive to the detecting means information signals representative of at least one of the mass per unit area, thickness and deposition rate of a thin film layer of material sensed by said detecting means.

4,427,712

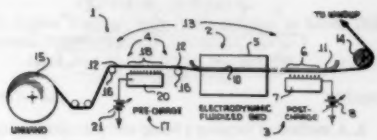
ELECTRODYNAMIC COATING PROCESS

Peter N. Y. Pan, Country Club Hills, Ill., assignor to Continental Can Company, Inc., New York, N.Y.

Continuation of Ser. No. 863,215, Feb. 22, 1977, abandoned, which is a division of Ser. No. 789,625, Apr. 21, 1977, Pat. No. 4,086,872, which is a division of Ser. No. 676,513, Apr. 13, 1976, Pat. No. 4,088,093. This application Aug. 27, 1979, Ser. No. 69,955

Int. Cl.³ B05D *1/04*

U.S. Cl. 427—13 **13 Claims**



1. An electrodynamic coating process comprising the steps of:

(a) providing a substrate to be coated;

(b) supplying charged particles of a given polarity charge in the vicinity of said substrate and thereby effecting coating of said substrate by said charged particles; and

(c) applying in the vicinity of the coated side of said coated substrate and at a time when the supplying step (b) has been completed a postcharge of a polarity the same as said given polarity so as to effect an increase in the electrostatic forces holding said particles to said substrate.

4,427,713

PLANARIZATION TECHNIQUE

Lawrence K. White, Cranbury, and Metodi Popov, Flemington, both of N.J., assignors to RCA Corporation, New York, N.Y.

Filed Jan. 17, 1983, Ser. No. 458,757

Int. Cl.³ B05D *3/06*

U.S. Cl. 427—54.1 **6 Claims**

1. A method of planarizing a coating on a substrate having topographical features, said coating having a thickness at least equal to the highest step height on the substrate and including a novolak resin and a diazoquinone sensitizer, comprising exposing said coating to actinic radiation so as to react the sensitizer in at least the upper one-third of the coating and then heating said coating by applying heat to the substrate on the surface opposite to said coating, thereby heating said coating through from the substrate.

4,427,714

THIN FILMS OF COMPOUNDS AND ALLOY COMPOUNDS OF GROUP III AND GROUP V ELEMENTS

Keith S. A. Davey, Royston, England, assignor to PA Management Consultants Limited, London, England

Filed Jan. 8, 1982, Ser. No. 338,094

Claims priority, application United Kingdom, Jan. 16, 1981, 8101396

Int. Cl.³ C04B *35/00*

U.S. Cl. 427—87 **7 Claims**

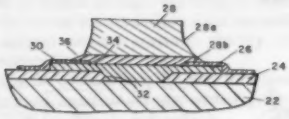
1. A method of producing a thin film of gallium arsenide comprising impinging onto a heated substrate a solution of gallium arsenate or a precursor thereof with an inert gas propellant, in a reducing gaseous atmosphere.

4,427,715

METHOD OF FORMING EXPANDED PAD STRUCTURE

James M. Harris, Palo Alto, Calif., assignor to National Semiconductor Corporation, Santa Clara, Calif.

Continuation of Ser. No. 180,592, Aug. 25, 1980, abandoned, which is a division of Ser. No. 921,493, Jul. 3, 1978, Pat. No. 4,258,382. This application Jul. 26, 1982, Ser. No. 401,480
Int. Cl.³ B05D 5/12
U.S. Cl. 427—96 7 Claims



1. A method of forming a bump and pad combination for the connection of conductor leads to a substrate comprising the steps of selecting a substrate having a window for connection thereto:

forming a pad structure having a predetermined lateral dimension from a metal layer which is in contact with said window,

forming a layer of passive protection material overlying the edges of said pad, leaving an opening in substantial alignment with the center of said pad, and

forming a bump in alignment with the center of said pad, to substantially overlap the edges of the layer of protective material over the entire periphery of said opening, and having lateral dimensions sufficiently smaller than the lateral dimensions of said pad to accommodate for both lateral misalignment and manufacturing tolerance of the bump, and locating said bump on said pad without any portion of said bump overlapping any lateral edge of said pad.

4,427,716

METHOD FOR PREDETERMINING PEEL STRENGTH AT COPPER/ALUMINUM INTERFACE

Erwin G. Siwek, Saratoga Springs, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Jan. 21, 1983, Ser. No. 459,748
Int. Cl.³ B05D 5/12
U.S. Cl. 427—99 9 Claims

1. A method for developing a bond between contiguous metallic laminae having a predetermined average unit magnitude, said method comprising the steps of:

(a) forming a copper film on a flexible aluminum carrier sheet to produce a laminate by applying copper directly on a major surface of said aluminum sheet by vapor deposition with the crystals of said copper film being predominately columnar in configuration, the yield strength of said aluminum sheet being significantly in excess of 10,000 psi and said surface being free from hydrocarbon contamination to an extent at least comparable to being in "chemically clean" condition at the time of such vapor deposition;

(b) heating said laminate in a protective atmosphere at a temperature in excess of about 150° C. for a preset time sufficient to develop a diffusion bond between said copper film and said aluminum sheet requiring a force of between about 0.2 and 2.0 pounds per lineal inch to peel said aluminum sheet from said copper film, the maximum heating exposure being such as not to reduce the yield strength of said aluminum sheet below about 10,000 psi and

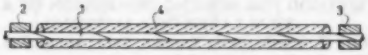
(c) cooling said laminate to room temperature in a protective atmosphere.

4,427,717

PROCESS FOR PRODUCING AN OBJECT WITH A CHIRALIC STRUCTURE OBTAINED FROM A SHAPEABLE MATERIAL SOURCE

Francis Gauthier, Paris, France, assignor to Thomson-CSF, Paris, France

Filed Sep. 28, 1982, Ser. No. 425,994
Claims priority, application France, Nov. 3, 1981, 81 20596
Int. Cl.³ G02B 1/10, 5/14; B05D 3/12, 1/36
U.S. Cl. 427—163 7 Claims



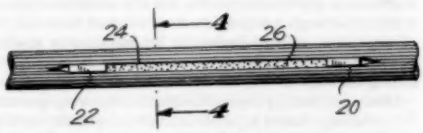
1. A process for producing an object having a helical structure comprising the steps of: (a) drawing the object along a drawing axis from a shapeable material source to form a drawing volume; (b) twisting the object around the drawing axis; (c) hardening the object by cooling the part thereof between the source and the cooled part thereof; (d) coating the object with a coating material to form an envelope; and (e) solidifying the envelope around the object, so as to fix the state of torsion thereof.

4,427,718

WEDGE ENCAPSULATION METHOD

Patrick Heron, 261 Raymond St., Hillsdale, N.J. 07642; Timothy Hartnett, 415 Beech St., Westwood, N.J. 07675, and Adam Wright, 210-25 Jamaica Ave., Jamaica, N.Y. 11428

Filed May 27, 1982, Ser. No. 382,393
Int. Cl.³ B05D 3/12
U.S. Cl. 427—175 12 Claims



1. A method of in-place encapsulation of a stressed structure-supporting cable strand formed of a plurality of bundled steel wires while the strand is bearing a stress load, comprising

forcing apart the wires of said strand to form a longitudinal gap extending into the interior of said cable strand,

then filling such longitudinal gap with a protective paste,

permitting the gap to close on said filled protective paste, so that said paste is urged by forces in the stressed wires to fill voids among the wires of the cable strand, and

providing, around at least the portion of the cable strand so treated with protective paste, encapsulating means to seal such portion from corrosive agents.

4,427,719

METHOD OF DEDUSTING METAL SULFATE GRANULES

William P. Moore, Hopewell, Va., assignor to Frit Industries, Inc., Ozark, Ala.

Filed Sep. 7, 1982, Ser. No. 415,742
Int. Cl.³ B05D 1/36, 7/00
U.S. Cl. 427—205 19 Claims

1. A method of eliminating dust, created by comminution in

metal sulfate processes, from granules of agricultural micronutrient metal sulfates, comprising:

(a) substantially coating micronutrient granules with a monomeric liquid, catalytically polymerizable by said metal sulfates;

(b) polymerizing catalytically said monomeric liquid until it forms an adhesive;

(c) contacting dust with coated granules until dust particles substantially adher to adhesive coated granules;

(d) polymerizing further until said adhesive is converted to a dry coating occluding substantially all dust particles on the granules.

4,427,720

VAPOR PHASE PROCESS FOR THE DEPOSITION OF A PROTECTIVE METAL COATING ON A METALLIC PIECE

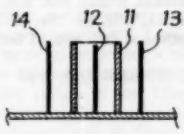
Georges M. C. A. Gauje, Saulx les Chartreux, France, assignor to Societe Nationale d'Etude et de Construction de Moteurs d'Aviation "S.N.E.C.M.A.", France

Filed Jun. 11, 1982, Ser. No. 387,481

Claims priority, application France, Jun. 18, 1981, 81 11988

Int. Cl.³ C03C *13/02*

U.S. Cl. 427—237 **4 Claims**



1. A process for the vapor phase deposition of a protective metal coating of aluminum, chromium, titanium or their mixtures or alloys on a metal piece comprising the steps of: (a) placing the metal piece in a suitable enclosure; (b) placing a chemical halide compound in the enclosure; (c) placing a donor in the enclosure adjacent the area of the metal piece to be coated, the donor being in the form of a thin sheet of the metal coating material, the surface area of the sheet is of the same order of magnitude as the area of the metal piece to be coated facing the sheet; and (d) heating and subsequently cooling the metal piece, the chemical halide compound and the donor such that a halide compound with the coating material is formed, the halide compound decomposing when coming into contact with the surface of the metal piece to be coated thereby directly depositing a uniform coating of the coating material on the metal piece.

4,427,721

METHOD OF COATING STEEL SUBSTRATES TO REDUCE CARBONACEOUS DEPOSITION THEREON

James A. Cairns, Wantage; Robert L. Nelson, Kingston Bagpuis, and James L. Woodhead, Didcot, all of England, assignors to United Kingdom Atomic Energy Authority, United Kingdom

Division of Ser. No. 954,532, Oct. 25, 1978, Pat. No. 4,297,246. This application Feb. 24, 1981, Ser. No. 237,639

Claims priority, application United Kingdom, Nov. 1, 1977, 45471/77

Int. Cl.³ B05D *3/02*

U.S. Cl. 427—376.5 **5 Claims**

1. In the method of coating a steel substrate to be used in the thermal cracking of hydrocarbons, the improvement wherein the surface of the substrate carries a refractory oxide coating provided by the steps of

(i) contacting the surface with a sol comprising a dispersion, in a liquid medium, of substantially unaggregated colloidal primary particles of a refractory material, the sol being capable of conversion to a gel the bulk density of which being at least 40% of the theoretical density of the refractory oxide when measured at ambient temperature and the gel being convertible to the refractory oxide;

(ii) drying the sol to convert the sol to a gel coating; and

(iii) firing to convert the gel coating to the refractory oxide coating, thereby to reduce carbonaceous deposition on the surface.

4,427,722

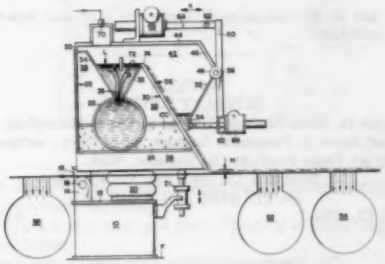
APPARATUS FOR APPLYING A CONTROLLED LAYER OF A SATURANT OR A COATING VIA A FREE-FALLING VERTICAL CURTAIN

Martin B. Keller, Hudson Falls, N.Y., assignor to Sandy Hill Corporation, Hudson Falls, N.Y.

Filed Jun. 30, 1982, Ser. No. 393,700

Int. Cl.³ B05D *1/30*

U.S. Cl. 427—420 **2 Claims**



1. A method of applying a layer of a saturating substance upon a travelling web consisting of the steps:

a. transporting the web along a horizontal path below a hopper,

b. feeding a charge of the saturating substance in the hopper upwardly over a hopper dam and onto a downwardly inclined slide where adjacent edge means defines a seal producing a pressurized chamber containing the charge of saturating substance which overflows the dam opening,

c. adjusting the edge means with respect to the slide for closing off the pressure chamber for the buildup of pressure therewithin and for controlling the amount of saturating substance allowed to escape from the pressurized chamber and thereby controlling the amount of saturating substance allowed to proceed further down the slide where at the termination of the slide the saturating substance freefalls onto the traveling web therebelow.

4,427,723

METHOD AND APPARATUS FOR LASER-STIMULATED VACUUM DEPOSITION AND ANNEALING TECHNIQUE

David M. Swain, Thousand Oaks, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Feb. 10, 1982, Ser. No. 347,741

Int. Cl.³ B05D *3/06, 5/00*; C23C *13/08*

U.S. Cl. 427—53.1 **7 Claims**

7. A coating method comprising the steps of:

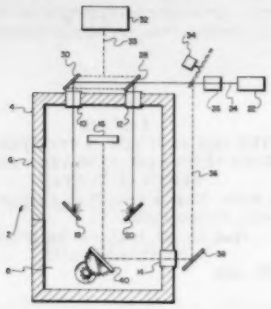
supporting a substrate in a vacuum chamber;

supporting a specimen of coating material within said chamber;

evaporating at least a portion of said specimen to provide a coating on said substrate;

directing a laser beam to scan said coating material on said substrate so as to provide sufficient energy to cause localized heating of the coating material deposited thereon and raise the energy of the coating to a level slightly below the

bonding energy of said coating material so as to anneal the coating material and drive out contaminants therefrom but not to provide enough energy to melt the underlying substrate.



4,427,724

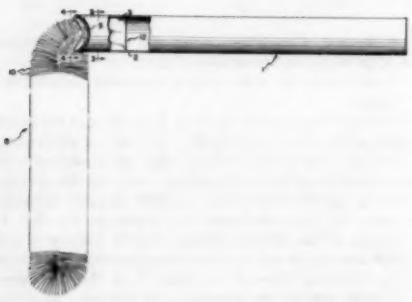
NOVELTY DEVICE

Martin H. Stark, Saginaw; George V. Pisani, Bloomfield Hills, and James J. Pauquette, Saginaw, all of Mich., assignors to Arrow Paper Products Co., Saginaw, Mich.

Filed Sep. 29, 1982, Ser. No. 426,790

Int. Cl.³ A41G *1/04*; D04D *1/00*

U.S. Cl. 428—7 **8 Claims**



1. A novelty device comprising a body open at one end and having a cavity at least at said one end; an elongate, flexible member having one end thereof accommodated in said cavity and the remainder thereof being outward of said body, said flexible member comprising a core and a plurality of streamers fixed to and extending transversely of said core; anchor means accommodated in said cavity; means securing said anchor means to said one of said flexible member; and retaining means reacting between said body at said one end thereof and said anchor means and retaining the latter and said one end of said flexible member within said cavity.

4,427,725

DIMENSIONALLY-RECOVERABLE ARTICLE

David Crofts, Cirencester, England, assignor to Raychem Limited, London, England

Filed Feb. 11, 1982, Ser. No. 347,828

Int. Cl.³ B32B *33/00*, *31/00*, *1/08*

U.S. Cl. 428—36 **17 Claims**

1. A polymeric article, at least part of which is dimensionally heat-recoverable, and has, coated on the surface of a dimensionally-recoverable portion thereof, a pliant, adhesive-receptive polymeric coating which softens at an elevated temperature of up to the recovery temperature of the article, which has no intrinsically adhesive properties, which is substantially non-curable at ambient temperatures and which includes a thermal curing agent which initiates curing of the coating of the recovery temperature of the article.

4,427,726

ADHESIVE-COATED ROLL

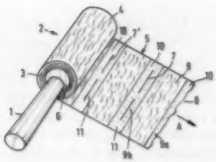
Emil Wolfrum, Forchheim, Fed. Rep. of Germany, assignor to Gebrauchs Geräte GmbH, Kriftel, Fed. Rep. of Germany

Filed Mar. 11, 1982, Ser. No. 357,217

Claims priority, application Fed. Rep. of Germany, Mar. 21, 1981, 3111150

Int. Cl.³ B32B *3/08*, *3/10*

U.S. Cl. 428—43 **14 Claims**



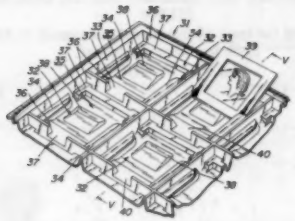
1. A roll for cleaning garments or the like, comprising an elongated convoluted flexible web having an inner side, an outer side and a plurality of at least substantially equidistant transversely extending weakened portions along which the web breaks in response to the application of tensional stresses and which divide the web into a file of neighboring sections each having a leader adjacent to the preceding weakened portion and a trailing portion adjacent to the next-following weakened portion; an adhesive coat provided at the outer side of said web; a plurality of first substantially strip-shaped layers consisting of a material which does not adhere to the adhesive coat and being provided at the inner sides of the leaders of said sections so that such leaders do not adhere to the adhesive coat at the outer side of each of those sections which are in overlapping relationship therewith, the width of each of said layers, as considered in the longitudinal direction of the web, being a small fraction of the distance between two neighboring weakened portions and each of said layers extending all the way to the preceding weakened portion; and a plurality of second strip-shaped layers consisting of a material which does not adhere to the adhesive coat and being provided at the inner sides of the trailing portions of said sections so that such trailing portions do not adhere to the adhesive at the outer side of each of those sections which are in overlapping relationship therewith, said first and second layers extending transversely of said web and completely surrounding said weakened portions.

4,427,727

SHEET FOR HOLDING TRANSPARENCIES

Jiro Ozeki, Tokyo, Japan, assignor to Slidex Corporation, Tokyo, Japan

Filed Jul. 26, 1982, Ser. No. 402,072
Claims priority, application Japan, Feb. 3, 1982, 57-14716
Int. Cl.³ B65D 1/36
U.S. Cl. 428—116 6 Claims



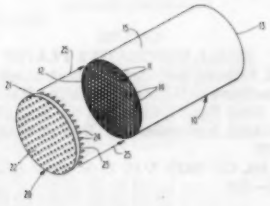
1. A sheet for holding transparencies, comprising a holder sheet, a plurality of rectangular recesses depressed from said holder sheet in rows and columns, a pair of earpieces extending from opposing sidewalls of each of said recesses toward the inside of the recess, a transparency-supporting wall means spaced from the earpieces of each of said recesses and extending toward the inside of the recess, a bottom wall depressed from said transparency-supporting wall means to a rectangular form at the center portion of said recess, the improvement comprising an inclined surface portion formed substantially at the center of the bottom wall of each of said recesses with an angle to the bottom wall.

4,427,728

MASKING APPARATUS FOR SELECTIVELY CHARGING HONEYCOMB STRUCTURES

James A. Belmonte, Corning, and Arthur E. Hillman, Campbell, both of N.Y., assignors to Corning Glass Works, Corning, N.Y.

Filed Aug. 24, 1981, Ser. No. 295,610
Int. Cl.³ B32B 3/12
U.S. Cl. 428—117 11 Claims



1. The combination of

a honeycomb structure having a pair of opposing end faces and a matrix of thin walls defining a multiplicity of hollow, open ended cells extending through said structure between said pair of end faces, including a selected subset of said cells,

and

a mask apparatus for use in bulk charging a flowable material into said selected subset of cells, said apparatus comprising:

at least one base member positioned across one end face,

a plurality of protruding members extending from each base member in the same direction, each protruding member in register with and extending into an open end of one of said cells,

and

means at said one end face for providing open access to open ends of cells in said selected subset by said flowable material,

and said apparatus coverably sealing the open ends of all but said subset of cells.

4,427,729

GLUE CHIPPED GLASS AND METHOD

John A. Messer, P.O. Box 648, Greer, S.C. 29651

Filed Apr. 9, 1982, Ser. No. 366,933
Int. Cl.³ B32B 17/10; B44C 1/22
U.S. Cl. 428—141 5 Claims

1. A method of automated mass production of glue-chipped glass comprising the steps of:

providing a source of animal glue solution at a desired heated temperature;

placing sheets of glass upon a traveling conveyor;

automatically conveying the sheets of glass to a glass-treating station;

lightly roughening an upwardly facing surface of said glass at said glass-treating station;

providing a pair of rollers at a glue appliction station arranged to define a nip therebetween and arranging one of said rollers to be rotatably driven in the direction of conveyance of said glass;

delivering said glue solution to said nip of said rollers and maintaining a reservoir of said glue solution between said rollers;

circulating a heated fluid through said rollers for heating said rollers to a desired temperature;

automatically conveying said glass from said glass-treating station to said glue application station;

applying a thin layer of said glue solution to said rotating roller and applying said glue solution from said roller to said glass surface passing beneath said rollers;

subsequently conveying said glass and glue layer to a dryer oven causing said applied glue to chip off cutting and removing portions of said glass to produce a chipping pattern on said glass; and

said glue-chipped glass sheets being automatically produced in large quantities having uniform and duplicative patterns.

4,427,730

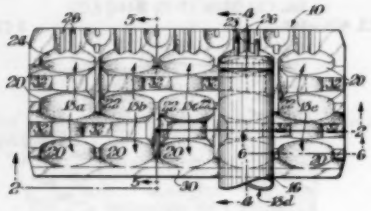
TUBE PACKING SHEET WITH SPACED SUPPORT SURFACES

Gerald L. Robbins, East Vassalboro, and Henry R. Vigue, Waterville, both of Me., assignors to Keyes Fibre Company, Waterville, Me.

Filed Apr. 26, 1982, Ser. No. 371,600
Int. Cl.³ B32B 3/02, 3/26
U.S. Cl. 428—156 5 Claims

1. A molded packing sheet of the type which is three dimensionally contoured for use in packing a stack of at least two superimposed layers of a plurality of elongated light tubes for storage and shipment, the sheet comprising (a) upwardly directed contours to position an upper layer of a plurality of

tubes in closely spaced apart parallel relationship in a common flat plane, the upwardly directed contours including (i) at least two laterally concave tube cradling surfaces for each tube in the upper layer, the cradling surfaces being spaced apart longitudinally of the tube, and (ii) longitudinally extending narrow ribs upstanding between adjacent tubes packaged in the upper layer to prevent lateral contact between such adjacent tubes, and (b) downwardly directed contours to hold the rest of the sheet elevated thereabove, such contours including a series of flat support surfaces in a common flat plane, the improvement being that the series of flat support surfaces is arranged to maintain a lower layer of the same number of tubes directly



below the upper layer and in the same relationship in a lower flat plane parallel with the upper flat plane, the series of support surfaces being in at least two laterally extending rows which are spaced apart longitudinally and including four outermost support surfaces one at each end of each row to provide two on each side of the sheet, and at least one support surface between adjacent tubes packaged in the lower layer, each support surface being laterally elongated with a width approximating the radius of a tube and a width to depth ratio which insures that the support surfaces will contact the upper part of the tubes in the lower layer and resist lateral shifting of the sheet and the upper layer of tubes packed therein with respect to the lower layer of tubes.

4,427,731

DECORATIVE WALLCOVERING IN ROLL FORM

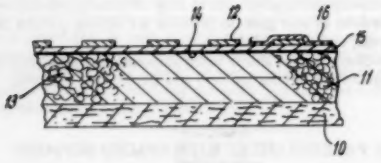
Frank Gibson, Darwen, England, assignor to Reed International P.L.C., London, England

Filed Nov. 1, 1982, Ser. No. 438,289

Claims priority, application United Kingdom, Nov. 6, 1981, 8133620; Mar. 23, 1982, 8208461

Int. Cl.³ B32B *3/00*

U.S. Cl. 428—159 **11 Claims**



1. A decorative wallcovering in roll form for application to the wall with an adhesive, said wallcovering having a substrate ply which carries a mechanically foamed ply, characterized in that the foamed ply is one derived from an aqueous latex, has both open and closed pores, has a toughened and porous surface and has outwardly facing decoration, and in that the substrate ply is thin, strength-giving, dimensionally stable, and primarily nonselectively absorbent to the constituents of the foam to provide a low stretch paste-the-wall strippable wallcovering.

4,427,732

SURFACE REPLICATION ON A COATED SUBSTRATE

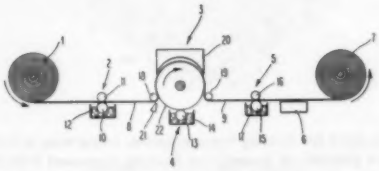
Lorin S. Gray, III, Portland; John A. Mattor, Bar Mills; Ben Millard, South Windham, and Franklin J. Ward, Cape Elizabeth, all of Me., assignors to Scott Paper Company, Philadelphia, Pa.

Division of Ser. No. 193,068, Oct. 2, 1980, Pat. No. 4,322,450, which is a continuation-in-part of Ser. No. 78,078, Sep. 24, 1979, Pat. No. 4,289,821. This application Mar. 25, 1982, Ser. No. 361,946

The portion of the term of this patent subsequent to Mar. 30, 1999, has been disclaimed.

Int. Cl.³ B05D *3/06*

U.S. Cl. 428—172 **5 Claims**



1. In a method of forming a plastic film or sheet on or against a release sheet, setting the film or sheet, and separating the set film or sheet from the release sheet, the improvement wherein the release sheet comprises a paper web having on at least one side thereof a coating of an electron beam radiation curable composition or material which has been cured by electron beam radiation, the outer surface of the coating having a desired surface effect formed by curing the coating in intimate contact with a replicative surface having the desired surface effect.

2. In a heat transferable printed design, including a release sheet, a printed design thereon of polyvinyl chloride plastisol ink or offset printing ink and an overcoat of polyvinyl chloride plastisol, the improvement wherein the release sheet comprises a paper web having on at least one side thereof a coating of an electron beam radiation curable composition or material which has been cured by electron beam radiation, the outer surface of the coating having a desired surface effect formed by curing the coating in intimate contact with a replicative surface having the desired surface effect.

4,427,733

SMALL DECORATIVE PLATES

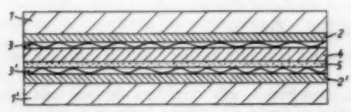
Martin Pöll, Fritzens, and Christian Covi, Innsbruck, both of Austria, assignors to D. Swarovski & Co., Wattens, Austria

Filed Sep. 17, 1981, Ser. No. 303,018

Claims priority, application Fed. Rep. of Germany, Oct. 9, 1980, 3038188

Int. Cl.³ B32B *3/16, 15.04*; C09J *7/02*

U.S. Cl. 428—200 **11 Claims**



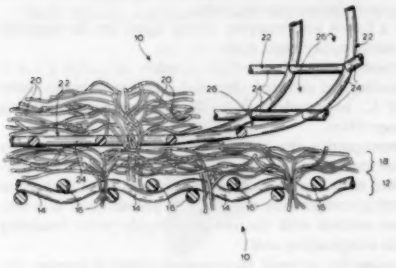
1. A decorative plate for ornamental use comprising first and second thermally activatable melt adhesive layers and a metal layer comprising a metalized layer on a synthetic film, said metal layer being positioned between said first and second thermally activatable melt adhesive layers, both of said thermally activatable melt adhesive layers being exposed on one side.

4,427,734

WET PRESS FELT FOR PAPERMAKING MACHINES

Cary P. Johnson, Clifton Park, N.Y., assignor to Albany International Corp., Albany, N.Y.

Filed Apr. 19, 1982, Ser. No. 369,367
Int. Cl.³ B32B 5/06, 5/26; D21F 7/08
U.S. Cl. 428—234 2 Claims



1. A wet press felt for use on a papermaking machine, which comprises;

a base fabric of interwoven textile yarns;

a plurality of non-woven layers of synthetic, textile fibers each of which is attached to an adjacent layer and collectively to the base fabric by needling; and

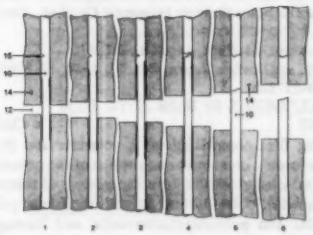
a layer of a monofilament mesh fabric (4 to 32 mesh) interposed between and attached by needling to the faces of adjacent layers of the non-woven textile opposed to those attached to the base fabric fibers, said mesh being made of a synthetic, polymeric resin.

4,427,735

CONTROLLED MATRIX CONTRACTION COMPOSITES

Michael R. Piggott, 35 Addington Ave., Toronto, Ontario, Canada

Filed May 27, 1981, Ser. No. 267,612
Claims priority, application United Kingdom, Jun. 6, 1980, 8018621
Int. Cl.³ B32B 5/16
U.S. Cl. 428—283 12 Claims



1. In a fibre-reinforced composite material consisting of a matrix having a Young's modulus of E and a plurality of fibres embedded in the matrix, the average fibre Poisson's shrinkage at breaking stress being C, the matrix being of a material which shrinks while changing from a liquid or plasticized state to a solid state, the linear shrinkage stress of the matrix being S,

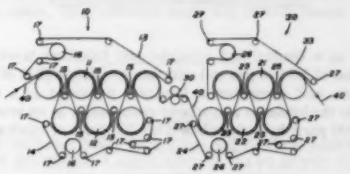
the improvement which comprises selecting a fibre material or a matrix material or both, such that S is substantially equal to, but not smaller than, the product of C and E.

4,427,736

ANTI-STATIC DRYER FABRIC

Oliver J. Beacom, Ottawa, and Hugh A. Moger, Kanata, both of Canada, assignors to JWI Ltd., Kanata, Canada

Filed Dec. 29, 1981, Ser. No. 335,409
Int. Cl.³ B05D 5/12; D03D 25/00; D21F 7/12
U.S. Cl. 428—288 6 Claims



1. A paper machine dryer fabric resistant to build-up of electrostatic charge, said fabric having on the exterior surfaces thereof a thermoset coating formed from a water-soluble arcylic latex modified by the addition of 0.2 to 10% by weight of an anti-static agent.

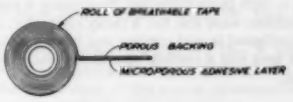
4. A method of preparing a paper machine dryer fabric resistant to build-up of electrostatic charge which comprises coating the fabric with a water soluble acrylic latex modified by the addition of 0.2 to 10% by weight of an anit-static agent, and curing the coating to a thermoset state.

4,427,737

MICROPOROUS ADHESIVE TAPE

Rudolfo D. Cliento, North Brunswick; Charles Riffkin, Cranbury, and Anthony L. LaVia, East Brunswick, all of N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed Apr. 23, 1981, Ser. No. 256,279
Int. Cl.³ B32B 27/08; C09J 7/02
U.S. Cl. 428—315.7 12 Claims



1. A breathable tape consisting of a porous backing layer and a microporous adhesive layer; said adhesive layer comprising from about 30% to about 60% by weight of a rubbery elastomer selected from the group consisting of natural rubber, silicone rubber, acrylonitrile rubber, polyurethane rubber, and polyisobutylene, from about 20% to about 65% by weight of one or more water soluble or water swellable hydrocolloids selected from the group consisting of guar gum, sodium carboxymethylcellulose, cross-linked sodium carboxymethylcellulose, pectin, gelatin, alginic acid, locust bean gum and karaya gum, and up to 35% by weight of one or more tackifiers, plasticizers, antioxidants, and preservatives; said adhesive layer being at from about 2 mils to 10 mils in thickness and having a porosity of from about 1 to about 100 cc/sec/in^2.

4,427,738

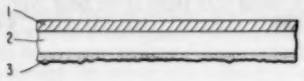
MAGNETIC RECORDING MEDIUM

Masaaki Fujiyama, and Nobutaka Yamaguchi, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Jun. 17, 1981, Ser. No. 274,565
Claims priority, application Japan, Jun. 17, 1980, 55-81569
Int. Cl.³ G11B 5/70
U.S. Cl. 428—323 8 Claims

1. A magnetic recording medium which is used at a high

tape speed of 2 to 10 m/sec, comprising a non-magnetic base, a magnetic recording layer on a first side of said base and a lubricant layer on a second side of said base, wherein said magnetic recording layer comprises magnetic particles dispersed in a binder, and wherein said lubricant layer has a thickness of 2.5 to 5 μm and a surface roughness (Ra) of 0.33 to 0.72 μm, and comprises a lubricant provided in a binder, wherein the binder is a synthetic resin binder in an amount of 30 to 300 parts by weight based on 300 parts of lubricant.



4,427,739

MULTIUSE PRESSURE-TYPE REPRODUCTION MATERIAL

Ulrich Kohle, Burgdorf; Hans Paffhausen, and Claus Hartmann, both of Hanover, all of Fed. Rep. of Germany, assignors to Pelikan Aktiengesellschaft, Hanover, Fed. Rep. of Germany

Filed May 3, 1982, Ser. No. 374,037

Claims priority, application Fed. Rep. of Germany, May 9, 1981, 3118980

Int. Cl.³ B41M 5/02, 5/10

U.S. Cl. 428—323 6 Claims

1. A multiuse material for the transfer of an impression onto a copy sheet, comprising:

a synthetic resin foil substrate; and

a color-transfer coating on said substrate, said coating comprising:

a synthetic resin binder,

a coloring agent distributed in said binder, said coloring agent including a dyestuff, a pigment or a mixture thereof, at least one nonionic tenside containing polyoxyethylene groups forming a vehicle for the dyestuff, pigment or mixture and constituting a plasticizer for the synthetic resin of said binder, said tenside being mixed with said binder in such proportion that the coating is maintained in a viscoelastic state and has a tacky character, and

a filler distributed in said coating and having a high specific surface area and a particle size in the range of 0.2 to 20 microns.

4,427,740

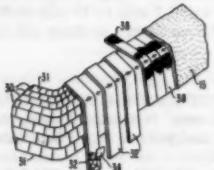
HIGH MAXIMUM SERVICE TEMPERATURE LOW CURE TEMPERATURE NON-LINEAR ELECTRICAL GRADING COATINGS RESISTANT TO V.P.I. RESINS CONTAINING HIGHLY REACTIVE COMPONENTS

Donald F. Stackhouse, Georgetown, and Ut V. Pham, Round Rock, both of Tex., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Apr. 9, 1982, Ser. No. 367,191

Int. Cl.³ B32B 5/16; B05D 1/12; H02K 15/00

U.S. Cl. 428—324 12 Claims



1. A method of making an insulated electrical member for high voltage use, said member having in combination, at least an electrical insulation layer disposed about said member, and a non-linear stress grading composition layer covering at least a portion of the electrical insulation layer, said method comprising the steps of:

(1) disposing a porous layer about a conducting electrical member,

(2) covering a portion of the porous layer with a non-linear stress grading composition comprising the admixture of:

(a) cycloaliphatic epoxy resin,

(b) a Lewis acid complex curing agent for the cycloaliphatic epoxy resin, and

(c) non-linear silicon carbide powder,

(4) heating the covered electrical member at up to about 130° C., to completely cure the non-linear stress grading composition,

(5) impregnating the porous layer with a reactive, highly polar insulating resin composition containing acid anhydride, such that at least the portion of non-linear stress grading composition covering the porous layer is in intimate contact with the reactive, highly polar insulating resin composition, and

(6) heating the covered, impregnated electrical member at a temperature and for a time effective to cure the reactive, highly polar insulting resin composition; where the non-linear stress grading composition after insulating resin cure is characterized as remaining adherent to the member, with no substantial degradation by the reactive, highly polar resin.

11. An insulated electrical member adapted for high voltage use, said member comprising:

(1) a conducting electrical member,

(2) a porous layer covering the conducting member, said porous layer having impregnated therein a cured reactive insulating resin, and

(3) a cured, adherent, non-linear stress grading composition covering a portion of the impregnated porous layer, said non-linear composition comprising the admixture of:

(a) 100 parts by weight of cycloaliphatic epoxy resin,

(b) about 2 parts to about 15 parts by weight of a Lewis acid complex curing agent for the cycloaliphatic epoxy resin, and

(c) about 200 parts to about 800 parts by weight of non-linear silicon carbide powder.

4,427,741

POLARIZING FILM

Kaoru Aizawa; Yozo Oishi, and Tatsuya Kubozono, all of Osaka, Japan, assignors to Nitto Electric Industrial Co., Ltd., Osaka, Japan

Filed Jul. 31, 1981, Ser. No. 288,872

Claims priority, application Japan, Jul. 31, 1980, 55-106009; Sep. 30, 1980, 55-137220

Int. Cl.³ G02B 5/30; B32B 27/34, 27/36

U.S. Cl. 428—332 4 Claims

1. A polarizing film comprising (a) a polarizer and (b) a heat-treated film formed on at least one surface of the polarizer from a member selected from the group consisting of thermoplastic polycarbonates, polysulfones, polyethersulfones, polyesters, polyamides and poly(estercarbonate)s' and having a retardation δ of about 500 nm or less with the retardation δ being calculated by the following equation:

$$\delta = \Delta n \cdot d$$

wherein δ is the value at which the polarizing direction of the incident light is directed 45° to the longitudinal axis direction of the film, Δn is the birefringence of the film and d is a thickness of the film in meters.

3. The polarizing film of claim 1, wherein said film (b) has a thickness of about 0.01 to about 1.0 mm.

4,427,742
CORE OR CORE PART FOR USE IN THE LOST WAX CASTING PROCESS

Kenneth Willgoose, Shelton Lock; Rondald Brien, Allestree; Peter E. Rose, Burton-on-Trent, and Clifford G. Hannah, Littleover, all of England, assignors to Rolls-Royce Limited, London, England

Filed Oct. 29, 1981, Ser. No. 316,431

Claims priority, application United Kingdom, Nov. 12, 1981, 8136378

Int. Cl.³ B32B 9/00

U.S. Cl. 428—338 **7 Claims**

1. A core or core part shaped to define a cavity in a subsequent core or cast article adapted for use in the lost wax casting process, said core or core part comprising an admixture of distributed short reinforcing fibers dispersed but devoid of deliberate orientation in a ceramic or disposable material, the core or core part including the short reinforcing fibers distributed therein adapted for removal from the core or article into which it is at least partially embedded to define the cavity.

4,427,743
LAMINATED PANEL

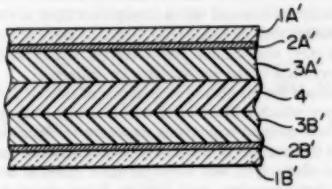
Kazuo Katsuki, Takarazuka; Kazuo Shibaoka, Itami; Shunji Ohnishi, and Takao Miwa, both of Nishinomiya, all of Japan, assignors to Nippon Sheet Glass Co., Ltd., Osaka, Japan

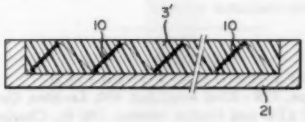
Continuation of Ser. No. 158,137, Jun. 10, 1980, abandoned. This application May 17, 1982, Ser. No. 379,015

Claims priority, application Japan, Mar. 27, 1980, 55-40489

Int. Cl.³ B32B 17/06, 27/36

U.S. Cl. 428—424.6 **13 Claims**





1. A laminated panel consisting of a glass sheet forming an outermost layer having a thickness of 0.2 to 2 mm, an adhesive layer having a thickness of 40 to 100 microns and composed of a thermoplastic resin having a softening point of less than about 100° C., containing substantially no plasticizer and being plastic at room temperature, a first plastic sheet having a thickness of 0.5 to 6 mm, a cushioning layer and a second plastic sheet having a thickness of 0.5 to 6 mm, said glass sheet being bonded to one surface of said first plastic sheet through said adhesive layer, and the other surface of said first plastic sheet being bonded to one surface of said second plastic sheet through said cushioning layer, said cushioning layer being composed of a resin selected from the group consisting of silicone resins, polyurethane resins, and a copolymer of ethylene and vinyl acetate, said first plastic sheet and second plastic sheet being composed of a resin selected from the group consisting of acrylic resins, vinyl chloride resins and styrene resins.

4,427,744
HEAT-ACTIVATED PRESSURE SENSITIVE ADHESIVE FOR BONDING LABEL STOCK TO PLASTIC FILM, METAL FOIL AND THE LIKE

Robert M. Hume, III, Cottage Grove, Minn., assignor to H. B. Fuller Company, St. Paul, Minn.

Filed Aug. 19, 1982, Ser. No. 409,405

Int. Cl.³ B32B 15/08; C08L 93/00; C09J 5/02

U.S. Cl. 428—462 **21 Claims**

1. An aqueous adhesive composition which when heated to an activating temperature acquires pressure-sensitive properties, which comprises an emulsion having at least an aqueous phase and a solid phase, wherein the solid phase comprises finely divided particles, that are mutually incompatible at room temperature, of a rubbery polymer, at least about 100 parts of a rosin compound, and at least 150 parts of a plasticizer each per 100 parts of the rubbery polymer, and the aqueous phase comprises less than about 50 wt-% of the emulsion.

4,427,745
NOVEL FIRE RETARDANT COMPOSITIONS AND METHODS

Glenn A. Pearson, 3709 S. George Mason Dr., Falls Church, Va. 22041

Continuation-in-part of Ser. No. 214,017, Dec. 5, 1980, Pat. No. 4,370,442. This application Aug. 3, 1982, Ser. No. 404,916

The portion of the term of this patent subsequent to Jan. 25, 2000, has been disclaimed.

Int. Cl.³ B32B 27/42

U.S. Cl. 428—524 **13 Claims**

1. A resinous solution comprising the reaction product of (a) about 100–140 parts by weight ofan aldehyde, (b) about 75–125 parts by weight of urea, (c) about 30–50 parts by weight of an alkanolamine, and (d) about 175–225 parts by weight of phosphoric acid, the solution being a stable clear solution having a good sheif-life and forming flexible hard nonburning films on substrates.

4,427,746
TI-BASE MATERIAL FOR EYEGLASS-FRAMES AND A METHOD FOR PRODUCING SAME

Masayuki Takamura, Hamamatsu, Japan, assignor to Nippon Gakki Seizo Kabushiki Kaisha, Japan

Filed Sep. 26, 1980, Ser. No. 190,943

Claims priority, application Japan, Sep. 28, 1979, 54-135422[U]; Oct. 1, 1979, 54-136614[U]; Jun. 11, 1980, 55-78820

Int. Cl.³ B32B 15/00

U.S. Cl. 428—614 **7 Claims**

1. A Ti-base material for eyeglass-frames comprising a Ti or Ti-base alloy containing 90% by weight or more of Ti core, and a sheath of Ni or an alloy consisting essentially of at least 80% by weight of Ni and at least one of Cr, Cu, Fe, Ag, Si, S,

Pb, Pt, Au, Sn, Co, rare earth elements, Mo, Al, Nb and Ti, said sheath in substantially concentric surface directly cladded

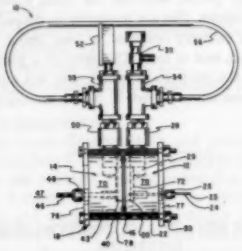
to said core, the clad ratio of said core to said sheath in the range of 0.7 to 0.99.

4,427,747

BRONZE SUPPRESSION IN AN ALKALI METAL/SULFUR AMMONIA BATTERY

John E. Bennett, and David E. Harney, both of Painesville, Ohio, assignors to Diamond Shamrock Corporation, Dallas, Tex.

Filed Jan. 28, 1982, Ser. No. 343,468
Int. Cl.³ H01M *10/36*
U.S. Cl. 429—50 **41 Claims**



1. An anolyte for use in an anhydrous rechargeable storage battery having an electrochemical reactant pair of an alkali or alkaline earth metal and sulfur and utilizing a cation exchange membrane separating anode and cathode compartments within the battery comprising:

essentially anhydrous ammonia;

a bronze suppressing, conductivity enhancing salt of the metal substantially soluble in the anhydrous ammonia; and

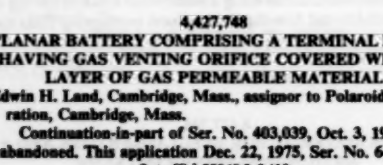
a bronze suppressing aromatic organic soluble in the anhydrous ammonia and substantially inert to chemical reaction with both the ammonia and the metal.

4,427,748

PLANAR BATTERY COMPRISING A TERMINAL PLATE HAVING GAS VENTING ORIFICE COVERED WITH A LAYER OF GAS PERMEABLE MATERIAL

Edwin H. Land, Cambridge, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Continuation-in-part of Ser. No. 403,039, Oct. 3, 1973, abandoned. This application Dec. 22, 1975, Ser. No. 642,798
Int. Cl.³ H01M *2/12*
U.S. Cl. 429—82 **44 Claims**



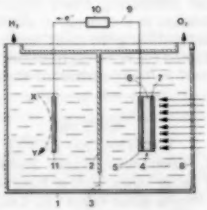
43. In a thin, flat laminar battery of the type comrising a plurality of superposed cells connected in series by conductive plastic intercell connectors and terminated at each end by a conductive plastic current collector covered by a metallic sheet terminal collector plate, the improvement which comprises at least one gas venting orifice formed in at least one of said metallic sheet terminal collector plates and a layer of gas permeable, water vapor impervious material coverting said orifice.

4,427,749

PRODUCT INTENDED TO BE USED AS A PHOTOCATALYST, METHOD FOR THE PREPARATION OF SUCH PRODUCT AND UTILIZATION OF SUCH PRODUCT

Michael Graetzel, c/o Ecole Polytechnique Federale Lausanne 33, avenue de Cour, CH-1015 Lausanne, Switzerland; Kuppuswamy Kalyanasundaram, Chavannes, Switzerland; Dung Duonghong; Michael Neumann-Spallart, both of Lausanne, Switzerland, and Enrico Borgarello, Echandens, Switzerland, assignors to Michael Graetzel, La Conversion, Switzerland

Filed Jan. 27, 1982, Ser. No. 343,177
Claims priority, application Switzerland, Feb. 2, 1981, 667/81
Int. Cl.³ H01M *6/36*; C25B *1/00, 1/02*
U.S. Cl. 429—111 **21 Claims**



1. Product usable as a photocatalyst, comprising a semi-conductor material in the form of discrete particles or as a layer which comprises part of an electrode, said semi-conductor material being subject to photo-corrosion, characterized in that the surface of the semi-conductor material which is intended to be illuminated is covered with a transparent layer of ruthenium oxide (RuO_2), iridium oxide (IrO_2), or a mixture of ruthenium oxide (RuO_2) and iridium oxide (IrO_2), which inhibits the photo-corrosion of the semi-conductor material.

10. Method for producing at least one of electric power and a substance which is chemically transformable with release of energy, said method comprising exposure to electromagnetic radiation of a surface of a semi-conductor material positioned within an electrolyte, said semiconductor material being subject to photocorrosion, said surface being covered with a transparent layer of ruthenium oxide (RuO_2), iridium oxide (IrO_2), or a mixture thereof, which inhibits the photo-corrosion of said semi-conductor material.

4,427,750

SELF ENERGIZING POWER PACK

Jacques Bilodeau, 525 - 32nd Ave., Apt. 401, Lachine, Quebec, Canada H8T 1Y2, and Gaston Marier, 760 St. Charles St., Apt. 4, St. Lambert, Quebec, Canada J4P 2A3

Filed Aug. 18, 1980, Ser. No. 178,978
Int. Cl.³ H01M *6/42*
U.S. Cl. 429—149 **7 Claims**

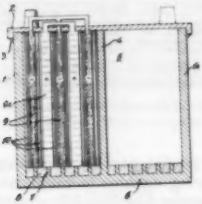
1. A self energizing power pack or accumulator which comprises:

a housing;

grid means at the bottom of said housing;

upright partitions dividing said housing into a plurality of individual cells;

each cell containing alternating upright positive plates and upright negative plates resting on said grid;
upright separator plates disposed between said positive plates and said negative plates;
there being one positive plate less than said negative plates;
said separator plates having means for allowing free movement of an electrolyte along both sides of said positive and negative plates;
each positive plate being provided with a plurality of holes extending therethrough along a diagonal line to ensure a good circulation of the electrolyte during re-charge and to reduce the time needed during said re-charge;
means for electrically and mechanically connecting said positive plates together;



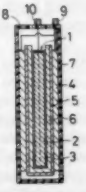
each negative plate being provided with a plurality of holes extending through said negative plate in the upper and lower portions thereof;
means for electrically and mechanically connecting said negative plates together;
a cover to seal said housing;
positive and negative terminals respectively associated with said positive and negative plates;
said cells being loaded with an electrolyte which comprises up to about 20 volume percent sulfuric acid, up to about 80 volume percent refined mineral oils mixture and a minor amount of acetic acid.

4,427,751

ALKALINE BATTERY

Nobuhiro Furukawa, Hirakata; Kenji Inoue, Higashiosaka, and Shuzo Murakami, Ibaraki, all of Japan, assignors to Sanyo Electric Co., Ltd., Osaka, Japan

Filed Jun. 15, 1981, Ser. No. 273,677
Claims priority, application Japan, Feb. 13, 1981, 56-20747
Int. Cl.³ H01M *6/04*
U.S. Cl. 429—206 **9 Claims**



1. A zinc alkaline secondary battery having a zinc negative electrode, a positive electrode, and an electrolyte, said zinc negative electrode comprising a base layer of zinc active material incorporating therein a cadmium substance selected from the group consisting of cadmium metal, a cadmium compound and mixtures thereof, and an outer layer made from a cadmium substance selected from the group consisting of cadmium metal, a cadmium compound and mixtures thereof, said outer cadmium layer applied to the surfaces of said zinc active base layer which are opposite to said positive electrode, whereby said outer cadmium layer is interposed between said base layer of zinc active material and said positive electrode.

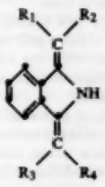
4,427,752

USE OF ISOINDOLINE PIGMENTS FOR PHOTOELECTROPHORETIC IMAGING

Jost von der Crone, Riehen, and Werner Sieber, Basel, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Apr. 28, 1982, Ser. No. 372,781
Claims priority, application Switzerland, May 8, 1981, 2997/81
Int. Cl.³ G03G *17/04*
U.S. Cl. 430—37 **12 Claims**

1. A photoelectrophoretic imaging process comprising
subjecting a liquid suspension of photosensitive pigment particles to an applied electric field between two electrodes, at least one of which is transparent, said electric field having a field strength of at least about 1.05×10^7 volts/meter, said suspension comprising a plurality of particles of pigment, said pigment being both the primary electrically photosensitive ingredient and the primary colorant for said particles, said particles having a particle size between 0.1 and 10 microns, wherein the pigment is an isoindoline of the formula



(I)

wherein R_1 and R_3 are cyano, —COOR or —CONHR', in which R is alkyl, cycloalkyl, aryl or a heterocyclic aromatic radical, and R' is hydrogen, alkyl, cycloalkyl, aryl or a heterocyclic aromatic radical, R_2 and R_4 are cyano, or wherein R_3 and R_4, together with the carbon atom linking them, form a heterocyclic 6-membered ring, and
exposing said suspension to an image through said transparent electrode with a source of electromagnetic radiation whereby an image is formed.

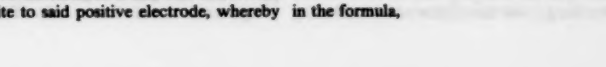
4,427,753

ELECTROPHOTOGRAPHIC PHOTOSENSITIVE MEMBER WITH DISAZO OR TRISAZO COMPOUND

Naoto Fujimura, Yokohama; Takashi Tanaka, Kawasaki; Takeshi Fujita, Kuki; Masakazu Matsumoto, Yokohama; Norie Takebayashi, Tokyo; Yoshio Takasu, Tama, and Shozo Ishikawa, Sayama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed May 24, 1982, Ser. No. 381,577
Claims priority, application Japan, Jun. 2, 1981, 56-85418; Jun. 3, 1981, 56-85365; Jun. 10, 1981, 56-89254; Jun. 10, 1981, 56-89255; Jun. 12, 1981, 56-90447; Jun. 12, 1981, 56-90448; Jun. 12, 1981, 56-90449; Jun. 12, 1981, 56-90450; Jun. 12, 1981, 56-90451; Jun. 12, 1981, 56-90452
Int. Cl.³ G03G *5/06*
U.S. Cl. 430—58 **76 Claims**

67. An electrophotographic photosensitive member comprising (i) a charge generation layer comprising an azo pigment represented by the following formula (I):



Formula (I)

in the formula,

Cp is a coupler residue;
A_1 and A_2 are each a divalent organic residue;
n is 0 or 1; and
when n is 0, A_3 is substituted or unsubstituted alkyl, substituted or unsubstituted aryl, or $-(CH{=}CH)_l-R'$, wherein R' is a substituted or unsubstituted heterocyclic ring residue and l is 0, 1 or 2, and when n is 1, A_3 is a divalent organic residue and (ii) a charge transport layer.

4,427,754

ELECTROPHOTOGRAPHIC LITHOGRAPHIC PRINTING PLATE

Koji Uchida; Jun Yamada; Shigeyoshi Suzuki, and Sadao Kuriu, all of Kyoto, Japan, assignors to Mitsubishi Paper Mills, Ltd., Tokyo, Japan

Filed Mar. 4, 1982, Ser. No. 354,799

Claims priority, application Japan, Mar. 10, 1981, 56-34399; Mar. 23, 1981, 56-42106; May 12, 1981, 56-70990; May 13, 1981, 56-70799; Jul. 1, 1981, 56-102705; Oct. 19, 1981, 56-166690

Int. Cl.³ G03G *5/10, 5/08, 5/04*

U.S. Cl. 430—60 **54 Claims**

1. An electrophotographic lithographic printing plate comprising
(1) a paper base;
(2) a precoat layer on one side of said paper base, which precoat layer contains at least
(a) 10% by weight or less (based on total solids) of a film-forming water-soluble polymer,
(b) about 30 to about 80% by weight (based on total solids) of a water-dispersible resin, and
(c) an inorganic pigment;
(3) a photoconductive layer provided on said precoat layer, which photoconductive layer contains
(a) photoconductive zinc oxide, and
(b) at least 2 binder resins different in acid value from each other by 5 or more, said binder resin mixture having an average acid value of 5 to 30; and
(4) a conductive back-coat layer on the other side of said paper base, which back-coat layer contains at least
(a) 10% by weight or less (based on total solids) of a film-forming water-soluble polymer,
(b) a water-dispersible resin, and
(c) a conductive agent.

4,427,755

METHOD FOR TRANSFERRING TONER IMAGES IN ELECTROPHOTOGRAPHY

Kazuyoshi Tokunaga, Katsuta, and Masayasu Anzai, Hitachi, both of Japan, assignors to Hitachi, Ltd. and Hitachi Koki Co., Ltd., both of Tokyo, Japan

Filed Jul. 10, 1979, Ser. No. 56,359

Claims priority, application Japan, Jul. 21, 1978, 53-88396

Int. Cl.³ G03G *15/00*

U.S. Cl. 430—97 **6 Claims**

1. In a method for electrophotography wherein a surface of a photoconductive and photosensitive member is uniformly charged with one polarity, exposed to an imaging light and subjected to development with toner charged with the same polarity as the photoconductive and photosensitive member, to form a toner image on the surface of said photoconductive and photosensitive member, and thereafter a surface of a recording medium is brought into contact with the surface of said photoconductive and photosensitive member on which the toner image has been formed and a transfer bias field is applied on the back of said recording medium to transfer the toner image onto the surface of said recording medium, the improvement which comprises the steps of erasing residual charge on the surface of said photoconductive and photosensitive member after said toner development, recharging the surface of said photoconductive and photosensitive member and the toner image at the same polarity as said uniform charging, and electrostatically transferring the toner image onto the surface of said recording medium with a transfer bias field having a polarity opposite to that of said polarity of said photoconductive and photosensitive member.

4,427,756

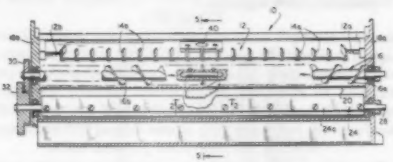
DEVELOPER CROSSMIXING METHOD

Edward F. Mayer, and Donald F. Pfeuffer, both of San Jose, Calif., assignors to Ricoh Company, Ltd., Japan

Division of Ser. No. 120,907, Feb. 12, 1980, Pat. No. 4,361,109. This application Apr. 15, 1982, Ser. No. 368,633

Int. Cl.³ G03G *13/08, 13/09*

U.S. Cl. 430—121 **4 Claims**



1. In a method of moving particles of developer material in an electrostatic printing machine to ensure adequate mixing thereof, including forming a curtain of the material and cascading it downwardly into a sump from whence the particles are raised upwardly to be formed again into said curtain, and deflecting the particles so that one portion of said particles are shifted in one lengthwise sense along a lengthwise portion of said curtain and another portion of said particles are shifted along another lengthwise portion of said curtain in an opposite lengthwise sense just prior to said forming of said curtain, the improvement in which certain of said particles adjacent each portion of said curtain are removed prior to said formation of said curtain and are moved to a section of said sump below the other portion of said curtain.

4,427,757

TANNABLE IMAGING ELEMENT

George W. Beebe, Roseville, Minn., and Michael T. Macioch, Baldwin, Wis., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed May 18, 1983, Ser. No. 495,805

Int. Cl.³ G03C *1/06;* G03F *7/02*

U.S. Cl. 430—264 **20 Claims**

1. A tannable photographic element which is a layered structure comprising in sequence
a. an opaque, translucent, or transparent primed base support,
b. optionally, a substantially unhardened gelatin or other hydrophilic colloid subbing layer coated over the primed surface of said base support at a coating weight of less than 0.3 g/m^2,
c. a layer of silver halide emulsion in gelatin substantially free of hardener and containing at least one tanning developer and at least one colored pigment dispersed therein that absorbs radiation in the range of 350 to 700 nm, the silver in said layer of silver halide emulsion being present in a quantity of less than 0.6 g/m^2, and the gelatin of said emulsion layer being present in a quantity so as to provide a silver/gelatin weight ratio of less than 0.5, and an emulsion layer gelatin/total tanning developer weight ratio in the range of 5 to 25, and
d. a protective topcoat layer of substantially unhardened gelatin and containing in the range of 0.02 to 0.3 g/m^2 of a non-diffusable hydroquinone compound,
said element being developable in an aqueous tanning activator comprising an alkaline solution having a pH of at least 9.5, and followed by a wash-off procedure for removing unexposed portions of the gelatin layer, and said at least one pigment being present in said element in a sufficient quantity to provide

reflection optical density in the range of 1.0 to 2.0 for an element with an opaque or translucent base support, and a transmission optical density in the range of 1.0 to 3.5 for an element with a transparent base support.

4,427,758

SINGLE EXPOSURE POSITIVE-WORKING PHOTOPOLYMER ELEMENT

John A. Quinn, Morganville, N.J., assignor to E. I. Du Pont de Nemours and Co., Wilmington, Del.

Filed Oct. 1, 1981, Ser. No. 307,648
Int. Cl.³ G03C *1/78*
U.S. Cl. 430—271 **5 Claims**

1. A positive-working photopolymer element consisting essentially of a support, on one side of which is coated, in order, (1) a nonphotosensitive layer comprising a gelatin binder, a colorant selected from the group consisting of pigments and dyes, and a sodium bisulfite adduct of a gelatin hardening agent of the group consisting of glutaraldehyde, glyoxal, formaldehyde, and starch dialdehyde and (2) a photopolymerizable layer comprising a photoinitiator, an actinic radiation absorber, a photopolymerizable monomer, and a polymeric binder.

4,427,759

PROCESS FOR PREPARING AN OVERCOATED PHOTOPOLYMER PRINTING PLATE

Robert R. Gruetzmacher, Chadds Ford, Pa., and Stanley H. Munger, Rumson, N.J., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Jan. 21, 1982, Ser. No. 341,250
Int. Cl.³ G03C *1/68*
U.S. Cl. 430—273 **18 Claims**

1. In a process for preparing flexographic photopolymerizable elements which comprises passing into the nip of a calender a mass of a hot photopolymerizable composition comprising an elastomeric binder, an ethylenically unsaturated compound having at least one terminal ethylenic group, and a photoinitiator or photoinitiator system, and, while hot, calendering the photopolymerizable composition between a support and a multilayer cover element to form a photopolymerizable layer therebetween, the improvement wherein the multilayer cover element consists essentially of a flexible cover film and a layer of an elastomeric composition and optionally between the flexible cover film and the layer of elastomeric composition a flexible polymeric film, the layer of elastomeric composition being adjacent to the photopolymerizable layer and being photosensitive or becoming photosensitive during or after calendering by contact with the photopolymerizable layer, said layer of elastomeric composition comprising an elastomeric polymeric binder and optionally a second polymeric binder and a nonmigratory dye or pigment and, in addition, when said layer of elastomeric composition is photosensitive one or more ethylenically unsaturated monomeric compounds and/or photoinitiator or initiator system.

4,427,760

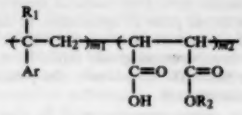
PHOTOHARDENABLE MATERIALS

Kohtaro Nagazawa, Minami Ooizumi; Tsutomu Satoh, Kashiwa; Kunio Morikubo, Souka; Fujio Tanaka, Koshigaya, and Masaki Okuyama, Nagareyama, all of Japan, assignors to Somar Manufacturing Co. Ltd., Tokyo, Japan

Filed Jun. 10, 1982, Ser. No. 387,130
Claims priority, application Japan, Jun. 10, 1981, 56-89100
Int. Cl.³ G03C *1/68*
U.S. Cl. 430—287 **5 Claims**

1. A photohardenable material, comprising:

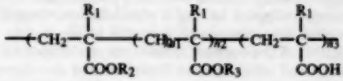
a copolymer (I′) having ethylenically unsaturated bonds and having an acid value of about 5 to 180 and a molecular weight of about 1,500 to 100,000, the copolymer (I′) being obtained by reacting carboxyl groups of a copolymer represented by formula (I)



(I)

wherein Ar represents a phenyl group or a substituted phenyl group; R_1 represents a hydrogen atom or a methyl group; R_2 represents a lower alkyl group; and the numbers m_1 and m_2 represent each a ratio of each monomer in the copolymer, wherein they have a relation of $m_1 \cong m_2$, with a compound having an oxirane ring and an ethylenically unsaturated bond;

a copolymer (II) having a molecular weight of about 50,000 to 500,000 comprised of three monomers represented by formula (II)



(II)

wherein R_1 represents a hydrogen atom or a methyl group; R_2 represents a lower alkyl group; R_3 represents a benzyl group, a substituted benzyl group having substituents on the phenyl ring, a tert-butyl group or an isobutyl group, but $R_2 \neq R_3$; and the numbers n_1, n_2 and n_3 represent each a ratio of each monomer in the copolymer, wherein they have relations of $n_1 < n_2$ and about $20 \cong (n_1+n_2)/n_3 \cong$ about 1;

a cross-linking agent having two or more ethylenically unsaturated bonds; and

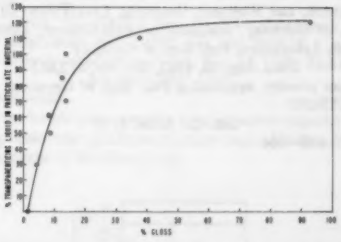
a photoactivator, wherein a ratio by weight of the copolymer (I′) to the copolymer (II) is in a range of (I′)/(II) being about 0.5 to 20.

4,427,761

PROCESS FOR SURFACE IMPROVEMENT OF SURPRINT PROOF WITH TRANSPARENTIZED PARTICULATE MATERIAL

Magalie M. Charles, Staten Island, N.Y., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Dec. 2, 1982, Ser. No. 446,226
Int. Cl.³ G03C *1/68*
U.S. Cl. 430—291 **12 Claims**



1. Process for modifying a tacky surface of a surprint multicolor proof having at least two nonplanar, nonsilver halide colored photoimaged elements sequentially bonded to a support, and a photosensitive tacky layer present as the outer layer of the proof by adhering to the tacky layer at least one particulate material having an oil absorptivity of at least 30% by weight based on the weight of particulate material as determined by the Gardner-Coleman Method, A.S.T.M. D-1483-60 and an average particle size of 0.1 to 20μ which comprises

(1) applying the particulate material to the tacky surface, and
(2) removing excess particulate material therefrom, the improvement wherein prior to application to the tacky surface the particulate material is treated with at least 5% by weight of a transparentizing oily liquid having a boiling point greater than 100° C. whereby the particulate material is made transparent.

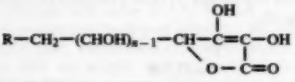
4,427,762

METHOD OF FORMING AN IMAGE WITH A PHOTOGRAPHIC CUPROUS HALIDE MATERIAL

Toshiaki Takahashi, Musashimurayama, and Noboru Itoh, Hino, both of Japan, assignors to Konishiroku Photo Industry Co., Ltd., Japan

Filed Dec. 15, 1982, Ser. No. 450,047
Claims priority, application Japan, Dec. 16, 1981, 56-203177; Dec. 16, 1981, 56-203178; Dec. 16, 1981, 56-203179
Int. Cl.³ G03C 5/30
U.S. Cl. 430—436 **12 Claims**

1. An image-forming method wherein a photosensitive material comprising a support having a photosensitive copper (I) halide emulsion that optionally contains silver halide and which has grains of the copper (I) halide crystal dispersed in a binder is subjected to imagewise exposure and development with an alkaline solution containing at least one compound selected from each of at least two of the following three groups: (A) a group consisting of α-amino acids, α-amino acid derivatives, aliphatic carboxylic acids, oxycarboxylic acids, ketocarboxylic acids, aromatic carboxylic acids, aminocarboxylic acids, quinoline derivatives, pyridine derivatives, amines and amine derivatives, which amines and amine derivatives form a Cu(II) complex having a stability constant between 5 and 15; (B) a group consisting of 4-aminophenols and 3-pyrazolidones; and (C) a group consisting of ascorbic acid derivatives of the following formula (I) and alkali metal salts thereof:



(I)

wherein R is a hydrogen atom or a hydroxyl group, and n is a positive integer of from 1 to 4; provided that when n=1, R represents only a hydroxyl group.

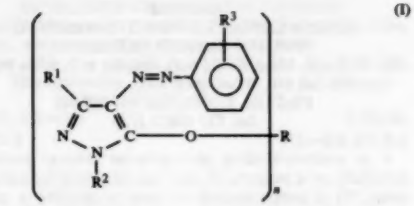
4,427,763

PHOTOGRAPHIC RECORDING MATERIAL WITH A PRECURSOR COMPOUND FOR A YELLOW MASK

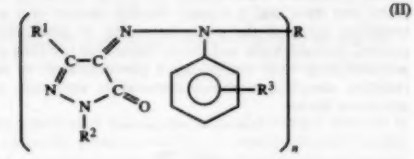
Joachim W. Lohmann, Odenthal; Günter Renner, Bergisch Gladbach, and Wolfgang Sauerteig, Leverkusen, all of Fed. Rep. of Germany, assignors to Agfa-Gevaert Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Aug. 30, 1982, Ser. No. 412,863
Claims priority, application Fed. Rep. of Germany, Sep. 12, 1981, 3136293
Int. Cl.³ G03C 1/76
U.S. Cl. 430—504 **6 Claims**

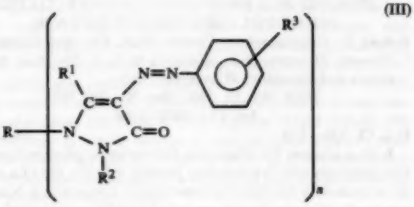
1. A color photographic recording material, having a layer support, at least one blue-sensitive, at least one red-sensitive and at least one green-sensitive silver halide emulsion layer, at least one blue-sensitive silver halide emulsion layer being located between the layer support and at least one green-sensitive silver halide emulsion layer (G) wherein at least one compound corresponding to at least one of the following formulae is contained in the layer (G) or in a layer adjacent thereto:



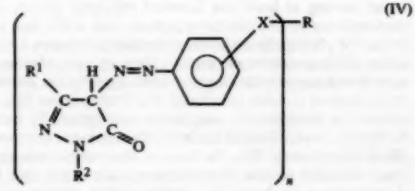
(I)



(II)



(III)



(IV)

wherein
R^1 to R^3 represent substituents usual for yellow mask couplers in photographic materials,
X represents —O—, —NR^4— or —S— in the ortho or para position.
R^4 represents alkyl or hydrogen,
n represents 1 or 2, and
R represents a monovalent or divalent acyl radical.

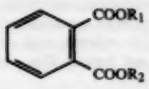
4,427,764

PROTECTIVE COATING FOR SILVER HALIDE PHOTOGRAPHIC LIGHT-SENSITIVE MATERIAL

Noriki Tachibana, Yokohama; Morio Kobayashi, Sagamihrara, and Noboru Fujimori, Hino, all of Japan, assignors to Konishiroku Photo Industry Co., Ltd., Japan

Filed Nov. 5, 1982, Ser. No. 439,437
Claims priority, application Japan, Nov. 19, 1982, 57-185672
Int. Cl.³ G03C 1/78
U.S. Cl. 430—523 **7 Claims**

1. A silver halide photogrpahic light-sensitive material which comprises at least one surface layer containing a compound having the following formula:



wherein R_1 and R_2 independently represent an alkyl group having from 12 to 24 carbon atoms.

4,427,765

HYDROPHILIC COATING OF SALT-TYPE PHOSPHORUS OR SULFUR POLYMER ON ALUMINUM SUPPORT MATERIALS FOR OFFSET PRINTING PLATES AND PROCESS FOR MANUFACTURE AND USE WITH LIGHT SENSITIVE LAYER THEREON

Dieter Mohr, and Werner Frass, both of Wiesbaden, Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Jun. 23, 1982, Ser. No. 391,131

Claims priority, application Fed. Rep. of Germany, Jul. 6, 1981, 3126636

Int. Cl.³ C23C *1/08*; G03C *1/94*; B41N *1/08*

U.S. Cl. 430—525 **14 Claims**

1. A web-shaped support material for offset printing plates, comprising a base layer comprised of aluminum or an aluminum alloy and having a roughened surface, and a hydrophilic coating of at least one salt-type hydrophilic organic polymer on the roughened surface of the base layer, wherein the salt-type hydrophilic organic polymer consists essentially of a complex-type product obtained by reacting (a) a water soluble organic polymer having acid functional groups containing phosphorus or sulfur selected from the group consisting of polyvinylphosphonic acid, polyvinylmethylphosphinic acid, a phosphoric acid ester of polyvinyl alcohol, polyvinylsulfonic acid, polyvinylbenzenesulfonic acid, a sulfuric acid ester of polyvinyl alcohol, an acetal of polyvinyl alcohol formed with a sulfonated aliphatic aldehyde or a salt of these polymers with a monovalent cation, with (b) a salt of an at least divalent metal cation, and wherein the quantity of complex-type reaction product is less than about 0.1 mg per dm^2 of support material surface.

2. An offset printing plate, comprising

a support material as defined by claim 1, and

a layer of a light-sensitive material coated on the support material.

4,427,766

HYDROPHILIC COATING OF SALT TYPE NITROGEN POLYMER ON ALUMINUM SUPPORT MATERIALS FOR OFFSET PRINTING PLATES AND PROCESS FOR MANUFACTURE AND USE WITH LIGHT SENSITIVE LAYER THEREON

Dieter Mohr, Wiesbaden, Fed. Rep. of Germany, assignor to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Jun. 23, 1982, Ser. No. 391,154

Claims priority, application Fed. Rep. of Germany, Jul. 6, 1981, 3126626

Int. Cl.³ C23C *1/08*; G03C *1/94*; B41N *1/08*

U.S. Cl. 430—525 **14 Claims**

1. A web-shaped support material for offset printing plates, comprising a base layer comprised of aluminum or an aluminum alloy and having a roughened surface, and a hydrophilic coating of at least one salt-type hydrophilic organic polymer on the roughened surface of the base layer, wherein the salt-type hydrophilic organic polymer consists essentially of a complex-type product obtained by reacting (a) a water-soluble organic polymer have carboxylate substituents, carboxylic acid amide substituents and/or carboxylic acid imide substituents as functional groups selected from the group consisting of polyacrylic acid, a copolymer based on polyacrylic acid, polyacrylamide, a copolymer based on polyacrylamide, a hydrolyzed copolymer based on ethylene or vinylmethyl ether and maleic acid anhydride, a copolymer which has been partly or completely subjected to an ammonolysis with NH_3 and is based on ethylene or vinylmethyl ether and maleic acid anhydride, carboxyalkyl cellulose or the mixed ethers thereof, or one of the salts of these polymers with a monovalent cation; with (b) a salt of an at least divalent metal cation, and wherein the quantity of complex-type reaction product is less than about 0.1 mg per dm^2 of support material surface.

2. An offset printing plate, comprising

a support material as defined by claim 1, and

a layer of a light-sensitive material coated on the support material.

4,427,767

COLOR PHOTOGRAPHIC SENSITIVE MATERIALS

Kozo Aoki, and Yoshio Seoka, both of Minami-ashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

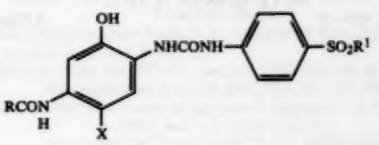
Filed Dec. 6, 1982, Ser. No. 447,365

Claims priority, application Japan, Dec. 7, 1981, 56-196676

Int. Cl.³ G03C *1/40*

U.S. Cl. 430—552 **6 Claims**

1. Silver halide color photographic sensitive materials containing a cyan dye forming coupler represented by the general formula (I):



(I)

wherein R represents a substituted or nonsubstituted alkyl group, aryl group or heterocyclic group, X represents a group capable of releasing by an oxidative coupling reaction with a developing agent, and R^1 represents a substituted or nonsubstituted alkyl group or aryl group.

4,427,768

METHOD OF HARDENING GELATIN

Katuji Kitatani; Hidefumi Sera; Atsuaki Arai; Masasi Ogawa; Kunio Ishigaki, all of Minami-ashigara, and Haruo Ogura, Matsudo, all of Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

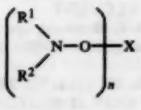
Division of Ser. No. 188,391, Sep. 18, 1980, abandoned. This application Jul. 2, 1982, Ser. No. 394,988

Claims priority, application Japan, Sep. 18, 1979, 54-119480

Int. Cl.³ G03C *1/30*

U.S. Cl. 430—623 **5 Claims**

1. A silver halide photographic light-sensitive material comprising at least one gelatin-containing layer hardened by a hardening agent of the formula (I)



(I)

wherein

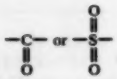
R^1 and R^2 each represent a monovalent group including a carbon atom or a nitrogen atom forming a bond together with the nitrogen atom N in the formula (I), the total number of carbon atoms in said monovalent groups being 4 or 5 carbon atoms; or R^1 and R^2 together form a hetero-

cyclic ring which can contain an oxygen atom together with said nitrogen atom N, and

n is 1 or 2; and

when n is 1, X is

and Y is an alkyl group, having from 1 to 8 carbon atoms, an aryl group having from 6 to 12 carbon atoms or an aralkyl group having from 7 to 13 carbon atoms; and when n is 2, X is



4,427,769

IMMUNOASSAY FOR FECAL HUMAN HEMOGLOBIN

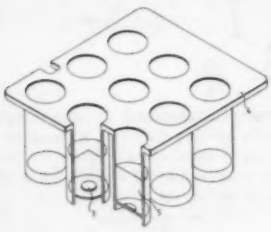
Herman Adlercreutz; Osmo A. Suovaniemi; Paul Partanen, and Jueea I. Suni, all of Helsinki, Finland, assignors to Labsystems OY, Helsinki, Finland

Filed Jan. 8, 1981, Ser. No. 223,421

Claims priority, application Finland, Jan. 17, 1980, 800140

Int. Cl.³ G01N *33/54, 33/72*

U.S. Cl. 435—7 5 Claims



1. A method for the specific detection of human hemoglobin in feces comprising

(a) contacting a sample of said feces with one side of a guaiac-impregnated filter paper which in turn is contacted on its other side by an absorbent for said hemoglobin, such that hemoglobin is absorbed into said absorbent,

(b) eluting said absorbed hemoglobin from said absorbent,

(c) reacting said eluted hemoglobin with a specific anti-human hemoglobin antibody to form a complex, and

(d) quantifying the amount of human hemoglobin complexed with said antibody.

4,427,770

HIGH GLUCOSE-DETERMINING ANALYTICAL ELEMENT

Shuenn-tzong Chen; Mark J. Sherwood, and Mary E. Warchal, all of Elkhart, Ind., assignors to Miles Laboratories, Inc., Elkhart, Ind.

Filed Jun. 14, 1982, Ser. No. 388,123

Int. Cl.³ G01N *33/66, 33/52*

U.S. Cl. 435—14 11 Claims

1. A method for preparing an analytical element for determining glucose in a liquid sample which method comprises the steps of

(a) impregnating a carrier with a first solution having dissolved therein 4-aminoantipyrine or a salt thereof and 3-hydroxy-2,4,6-triiodobenzoic acid or 3,5-dichloro-2-hydroxy-benzene sulfonic acid, or a salt thereof, a glucose oxidase and a peroxidase, and drying the carrier; and

(b) applying to the carrier a second solution of film-forming agent in a volatile solvent, and drying to remove the volatile solvent and leave a film over the dried first impregnant.

10. A method for determining the glucose content of whole blood within the range of about 2000 to 8000 mg/liter comprising contacting the whole blood with an analytical element produced by the process of claim 1, and matching the resulting color of the element with predetermined standards.

4,427,771

ASSAY METHOD FOR AMYLASE ACTIVITY AND METHOD OF PRODUCING MALTOSE DEHYDROGENASE FOR USE THEREIN

Hideo Misaki; Eiji Muramatsu; Hidehiko Ishikawa, and Kazuo Matsuura, all of Shizuoka, Japan, assignors to Toyo Jozo Kabushiki Kaisha, Tagata, Japan

Filed Oct. 14, 1981, Ser. No. 311,263

Claims priority, application Japan, Oct. 14, 1980, 55-144063

Int. Cl.³ C12N *1/20;* C12Q *1/40, 1/32;* C12R *1/11*

U.S. Cl. 435—22 8 Claims

1. An assay method for amylase activity in a biological specimen containing the enzyme amylase, which comprises contacting a said specimen with a substrate which is a glucose polymer selected from the group consisting of amylose, amylopectin, starch and starch hydrolyzate having a lower-alkyl etherified reducing terminal glucose residue, thereby to decompose a portion of said substrate, contacting the decomposed substrate with maltose dehydrogenase and NAD or NADP, and measuring the amount of reduced NAD or NADP as an indication of amylase activity in said specimen.

4,427,772

APPARATUS HAVING AUTOMATIC CALIBRATION FOR DETERMINING HYDROGEN PEROXIDE CONCENTRATION

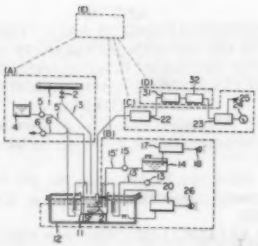
Yasuo Kodera, Shiki; Toshiaki Ishii, Niiza, and Minoru Ohashi, Oizumi, all of Japan, assignors to Oriental Yeast Co. Ltd., Tokyo, Japan

Filed Aug. 6, 1981, Ser. No. 290,574

Claims priority, application Japan, Sep. 18, 1980, 55-128558

Int. Cl.³ G01N *27/30, 31/10, 35/00*

U.S. Cl. 435—27 11 Claims



1. An apparatus for determining a concentration of hydrogen peroxide in an aqueous solution comprising:

(A) sample means for sampling a certain quantity of aqueous hydrogen peroxide solution;

(B) reacting means for decomposing the sample with a hydrogen peroxide decomposing agent;

(C) oxygen concentration determining means for determining the quantity of oxygen dissolved in the sample as an electric current, said dissolved oxygen being generated during the decomposition;

(D) automatic calibration means for keeping constant the

sensitivity of an oxygen detector which calibration means comprises means for introducing a quantity of liquid into a reaction vessel, means for aerating the liquid, and means for using the aerated liquid as a standard to calibrate the sensitivity of the concentration determining means; and

(E) sequence circuit means for controlling the operation of the respective means described above.

4,427,773

METHOD FOR PRODUCING L-GLUTAMIC ACID BY FERMENTATION

Takayasu Tsuchida, Kawasaki; Kiyoshi Miwa, Matsudo; Shigeru Nakamori, Yokohama, and Haruo Momose, Kamakura, all of Japan, assignors to Ajinomoto Company Incorporated, Tokyo, Japan

Filed Apr. 17, 1981, Ser. No. 255,169

Claims priority, application Japan, Apr. 17, 1980, 55-51001; Apr. 17, 1980, 55-51002

Int. Cl.³ C12N *15/00, 1/00;* C12P *13/14*

U.S. Cl. 435—110 **9 Claims**

1. The L-glutamic acid producing transformant which is *Brevibacterium lactofermentum* NRRL B-12408.

4,427,774

PROCESS FOR PRODUCING L-THREONINE

Hideaki Yukawa; Terukazu Nara, and Yoshihiro Takayama, all of Ibaraki, Japan, assignors to Mitsubishi Petrochemical Co., Ltd., Tokyo, Japan

Filed Mar. 17, 1982, Ser. No. 358,952

Claims priority, application Japan, Mar. 23, 1981, 56-40374

Int. Cl.³ C12P *13/08;* C12N *1/32, 1/20*

U.S. Cl. 435—115 **7 Claims**

1. A process for producing L-threonine from a mutant bacterium which utilizes ethanol and has the ability to produce and accumulate L-threonine when culturing said bacterium, comprising aerobically culturing a mutant bacterium obtained by mutagenizing *Acenetobacter calcoaceticus* YK-1011 having FERM-P No. 5910, in a culture medium in which ethanol is the main carbon source to produce and accumulate L-threonine in a culture liquor and then recovering L-threonine.

4,427,775

MYCELIAL PELLETS HAVING A SUPPORT CORE

Li F. Chen; Cheng S. Gong, and George T. Tsao, all of West Lafayette, Ind., assignors to Purdue Research Foundation, West Lafayette, Ind.

Continuation of Ser. No. 100,816, Dec. 6, 1979, Pat. No. 4,321,327. This application Sep. 10, 1981, Ser. No. 300,744

The portion of the term of this patent subsequent to Mar. 23, 1999, has been disclaimed.

Int. Cl.³ C12P *7/06, 1/02;* C12N *11/10;* C12M *1/40*

U.S. Cl. 435—161 **9 Claims**

1. A spherical shaped mycelial pellet suitable for use in the biocatalytic conversion of organic compounds which comprises a rigid spherical core having a diameter ranging from about 0.1 mm to 1.0 cm surrounded by a porous integral webbed layer having a thickness of about 1 mm to 5 mm, said layer forming a spherical encasement of structural integrity about the rigid core and being composed of filamentous hyphae of a mycelial microorganism, said pellet being further characterized in that the webbed layer is separated from said core by a substantially void space and is attached to said core by a portion of mycelium of said microorganism.

4,427,776

COMPOSITION OF MATTER AND PROCESS

Howard A. Whaley; William C. Snyder; John C. Greenfield, all of Portage, and John H. Coats, Kalamazoo, all of Mich., assignors to The Upjohn Company, Kalamazoo, Mich.

Filed Sep. 21, 1981, Ser. No. 304,393

Int. Cl.³ C12P *1/06;* A61K *35/00*

U.S. Cl. 435—169 **2 Claims**

1. A process for preparing antibiotic U-64,815, which in its essentially pure form has the following characteristics:

(a) molecular weight range of 1,104–1,324;

(b) molecular formula: $C_{60\text{-}65}H_{82\text{-}102}N_{1\text{-}3}O_{18\text{-}25}$;

(c) is insoluble in water and hexane, soluble in methanol, acetone, methylene chloride, ethanol, and dimethylsulfoxide;

(d) a characteristic ^{13}C-NMR spectrum as shown in FIG. 3 of the drawings;

(e) a characteristic UV spectrum as shown in FIG. 2 of the drawings; and,

(f) a characteristic infrared absorption spectrum when dissolved in a mineral oil mull as shown in FIG. 1 of the drawings;

which comprises cultivating *Streptomyces microspinus,* having the identifying characteristics of NRRL 12524, in an aqueous nutrient medium under aerobic conditions until substantial antibiotic U-64,815 activity is imparted to said medium.

4,427,777

ENZYMATIC CONVERSION OF RED CELLS FOR TRANSFUSION

Jack Goldstein, New York, N.Y., assignor to New York Blood Center, Inc., New York, N.Y.

Division of Ser. No. 177,972, Aug. 14, 1980, Pat. No. 4,330,619. This application Aug. 13, 1981, Ser. No. 292,558

The portion of the term of this patent subsequent to May 18, 1999, has been disclaimed.

Int. Cl.³ C12N *05/00;* A61K *35/14;* A01N *1/00*

U.S. Cl. 435—240 **8 Claims**

1. A composition comprising directly transfusable O or AH erythrocytes characterized by:

A. absence of P_1 antigenicity;

B. absorption and release of oxygen in vivo;

C. an adenosine-5'-triphosphate content above 90% of that of naturally occurring B erythrocytes;

D. being substantially free of terminally alpha linked galactose trihexosyl ceramide; and

E. absence of B antigenicity determined by hemagglutination assay.

8. A composition comprising erythrocytes of the H-antigen type prepared by a process which comprises:

(a) equilibrating said erythrocytes to a pH of 5.7–5.8;

(b) thereafter contacting the so-equilibrated erythrocytes with α-galactosidase for a period sufficient to convert the B-antigen in said erythrocytes to the H-type;

(c) thereafter removing the said α-galactosidase from said erythroctes; and

(d) re-equilibrating said erythrocytes to a pH of 7.2–7.4, said erythrocytes being in admixture with a physiologically acceptable medium.

4,427,778

ENZYMATIC PREPARATION OF PARTICULATE CELLULOSE FOR TABLET MAKING

Dane W. Zabriskie, West Chester, Pa., assignor to BioChem Technology, Inc., Malvern, Pa.

Filed Jun. 29, 1982, Ser. No. 393,501

Int. Cl.³ D21C *1/00;* C12P *19/04*

U.S. Cl. 435—277 **14 Claims**

1. A process for converting cellulose to a form suitable for tablet making, said process comprising subjecting cellulose to hydrolysis using a cellulase enzyme for a time sufficient to yield a highly crystalline, particulate cellulose hydrolysate

which forms a hard, coherent mass when subjected to a predetermined compressive force.

4,427,779

AGGLUTINATION-INHIBITION TEST METHOD FOR DETECTING IMMUNE COMPLEXES

Rudolph P. Reckel, Bridgewater, and Joanne L. Harris, Annandale, both of N.J., assignors to Ortho Diagnostic Systems Inc., Raritan, N.J.

Filed May 26, 1982, Ser. No. 382,262

Int. Cl.³ G01N *33/54*

U.S. Cl. 436—507 **7 Claims**

1. A method for detecting immune complexes containing endogenously bound Clq in a biological fluid sample comprising the steps of:

(a) providing Clq coated reagent cells;

(b) further providing non-human anti-Clq immunoglobulin;

(c) isolating from the biological fluid sample immune complexes if present in said fluid;

(d) combining said cells of (a), said immunoglobulin of (b) and the isolate of (c) to form a mixture;

(e) filling capillary tubes with said mixture of (d);

(f) allowing any immunological reactions to occur; and

(g) reading the capillary tube for the presence or absence of agglutination for determining the absence or presence of said immune complexes, respectively.

4,427,780

METHOD FOR ASSAYING VITAMIN-CONTAINING COMPOSITIONS FOR VITAMIN ANALOGUES

Robert H. Allen, Englewood, Colo., assignor to University Patents, Inc., Norwalk, Conn.

Filed Aug. 13, 1981, Ser. No. 292,370

Int. Cl.³ G01N *33/58, 33/60*

U.S. Cl. 436—505 **7 Claims**

1. A method for assaying a vitamin-containing multicomponent composition to determine the extent of conversion of said vitamin to one or more analogues thereof comprising the steps of:

(a) adding a known quantity of a radioactive labeled form of said vitamin to be assayed to a sample of said composition;

(b) incubating the mixture obtained in step (a) for a sufficient period of time to enable conversion of said radioactive labeled vitamin to vitamin analogues by the interaction of components of said mixture;

(c) fractionating said incubated mixture of step (b) into a vitamin rich fraction and a vitamin poor fraction, said vitamin rich fraction being rich in said vitamin to be assayed and substantially devoid of vitamin analogues formed in step (b); and

(d) measuring the content of radioactive labeled vitamin in said vitamin rich fraction.

4,427,781

PARTICLE AGGLUTINATION IMMUNOASSAY WITH AGGLUTINATOR FOR DETERMINING HAPTENS; PACIA

Pierre L. Masson, Brussels; Daniel Collet-Cassart, Limal, and Carl G. Magnusson, Brussels, all of Belgium, assignors to International Institute of Cellular and Molecular Pathology, Belgium

Filed Jan. 24, 1984, Ser. No. 358,566

Claims priority, application United Kingdom, Mar. 16, 1981, 8108112

Int. Cl.³ G01N *33/54*

U.S. Cl. 436—509 **10 Claims**

1. A method of assaying a hapten in a liquid sample, which comprises mixing with the liquid sample (i) finely divided inert particles bearing a reagent, (ii) an agglutinator and (iii) at least one other reagent, and determining the presence and/or amount of said hapten from the extent of agglutination of the particles, wherein:

(a) the finely divided particles bear the same hapten as is under assay, or a specific analogue thereof;

(b) said other reagent is an antibody against said hapten;

(c) the amount of said antibody added to the mixture is less than the amount required to cause 100% agglutination of the particles; and

(d) the agglutinator causes agglutination of hapten- or hapten analogue-bearing particles on which the antibody has formed a complex with said hapten or hapten analogue and does not cause agglutination of uncomplexed particles, uncomplexed hapten or free hapten-antibody complexes.

4,427,782

ISOLATION OF PRINCIPAL OUTER MEMBRANE PROTEIN AND ANTIGEN OF *CHLAMYDIA TRACHOMATIS*

Harlan D. Caldwell, 821 Parker Ave., Hamilton, Mont. 59840, and Julius Schachter, 17 Channel Dr., Corta Madera, Calif. 94925

Filed Mar. 3, 1981, Ser. No. 240,223

Int. Cl.³ G01N *33/56, 33/58, 33/60*; C07G *7/00*

U.S. Cl. 436—542 **19 Claims**

16. Antisera compositions useful in immuno diagnostic assays of *Chlamydia trachomatis* infection in mammals, said compositions being recovered from the blood serum of animals which have been previously inoculated with the principal outer membrane protein of *Chlamydia trachomatis*, said protein having a mean molecular weight of about 39,500 daltons.

4,427,783

IMMUNOASSAY OF THYMOSIN α_1

Edward Newman, West Orange; A. Hirotoshi Nishikawa, West Caldwell; Herbert E. Spiegel, Cedar Grove, and Julia Symington, Passaic, all of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Filed Dec. 14, 1981, Ser. No. 330,402

Int. Cl.³ G01N *33/54, 33/56, 33/74*

U.S. Cl. 436—542 **16 Claims**

1. In a method for the assay of thymosin α_1 in a sample, which method comprises mixing said sample with a known amount of labelled thymosin α_1 and an antibody which will selectively complex with said thymosin α_1, separating the resulting antibody-antigen complex from uncomplexed labelled thymosin α_1, measuring the degree of binding of the said labelled thymosin α_1 in said complex and determining the amount of thymosin α_1 present in said sample by comparing said degree of binding to a standard curve, the improvement which comprises employing as the antibody therein an antibody which has been elicited in a mammal in response to an immunogen comprising [Tyr^1]-thymosin α_1 coupled to an immunogenic carrier protein.

4,427,784

FLUOPHOSPHATE OPTICAL GLASS

Hiroshi Nakamura, Yokohama, and Takeo Ichimura, Tokyo, both of Japan, assignors to Nippon Kogaku K.K., Tokyo, Japan

Continuation of Ser. No. 136,774, Apr. 3, 1980, abandoned. This application Jul. 6, 1981, Ser. No. 280,468

Claims priority, application Japan, Apr. 24, 1979, 54-50401

Int. Cl.³ C03C *3/16, 3/18*

U.S. Cl. 501—44 **2 Claims**

1. Beryllium-and arsenic-free fluophosphate optical glass having a refractive index of from 1.4451 to 1.48 and an Abbe number of more than 90 to 97 containing fluorine ion F^- and oxygen ion O^{2-} as negative ions, wherein when the positive ions in the glass are expressed as fluorides, said glass consists essentially of, in mol percent:

PF_5	8–17

-continued

AlF_3	24–40
CaF_2	22–34
SrF_2	0.8–22
BaF_2	0.8–20
$SrF_2 + BaF_2$	8–28
SiF_4	0.05–4
R^IF	0–8
(R^IF is a combination of one or two or more of LiF, NaF or KF)	
MgF_2	0.8–18
ZnF_2	0–7
YF_3	0–7
LaF_3	0–7

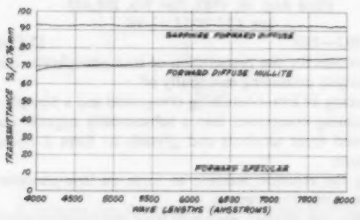
and the ratio F^-/O^{2-} in the glass (the ratio of fluorine ion number to oxygen ion number) is in the range of 3.7–11; whereby the tendency of the optical glass during formation to devitrify is suppressed and the viscosity of the glass in the molten state is enhanced to reduce striations.

4,427,785

OPTICALLY TRANSLUCENT CERAMIC

Svante Prochazka, Ballston Lake, and Frederic J. Klug, Amsterdam, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed May 25, 1982, Ser. No. 381,822
Int. Cl.³ C04B 35/18
U.S. Cl. 501—128 19 Claims



1. A process for producing a mullite body optically translucent in the visible wave length which comprises providing an amorphous shapeless mixed oxide powder consisting essentially of from about 72.5 weight % to about 74 weight % Al_2O_3 balance SiO_2 with a surface area ranging from about 100 square meters per gram to about 400 square meters per gram and a bulk density ranging from about 0.2 g/cc to about 0.3 g/cc containing a significant amount of water, calcining said powder at a temperature ranging from about 490° C. to about 1100° C. to remove water and any organic material therefrom leaving no significant amount thereof producing an amorphous shapeless mixed oxide powder consisting essentially of from about 72.5 weight % to about 74 weight % Al_2O_3 balance SiO_2, said calcining having no significant effect on the oxide composition or morphology of said powder, said calcined powder being pressable at about room temperature into a compact having a minimum density of 1.0 g/cc, pressing said calcined powder into a compact having a minimum density of 1.0 g/cc, sintering said compact at a temperature which has no significant deleterious effect on it ranging from about 1500° C. to about 1675° C. in oxygen or in a vacuum ranging from about 0.05 torr to about 1 torr producing a gas-impermeable compact, and hot isostatically pressing said gas-impermeable compact with a gas which has no significant deleterious effect on it at superatmospheric pressure of at least about 5000 psi at a temperature ranging from about 1500° C. to about 1700° C. producing a body of theoretical density based on the density of 3.16 g/cc±0.01 or 3.17 g/cc±0.01 for said mullite body, said gas being selected from the group consisting of argon, helium, nitrogen and mixtures thereof.

4,427,786

ACTIVATION OF HIGH SILICA ZEOLITES

Joseph N. Miale, Lawrenceville, and Clarence D. Chang, Princeton, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Mar. 8, 1982, Ser. No. 355,418
Int. Cl.³ B01J 29/28, 37/26
U.S. Cl. 502—61 13 Claims

1. A method for enhancing the activity of a crystalline zeolite having a silica-to-alumina mole ratio greater than about 100, wherein said zeolite has been synthesized from a reaction mixture containing bulky ions, which comprises compositing said crystalline zeolite with a support matrix material of alumina, gallia or a combination thereof, calcining the resulting supported zeolite at a temperature of from about 200° C. to about 600° C. for a period of time ranging from about 1 minute to about 48 hours, contacting said calcined supported zeolite with volatile boron fluoride in a dry environment at a temperature of from about 0° C. to about 100° C. until said supported zeolite is saturated with said boron fluoride, purging unreacted boron fluoride from said boron fluoride contacted supported zeolite, hydrolyzing said boron fluoride contacted supported zeolite, contacting said hyrolyzed supported zeolite with an ammonium salt solution and thereafter calcining said supported zeolite at a temperature of from about 200° C. to about 600° C.

4,427,787

ACTIVATION OF ZEOLITES

Joseph N. Miale, Lawrenceville, and Clarence D. Chang, Princeton, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Mar. 8, 1982, Ser. No. 355,413
Int. Cl.³ B01J 29/28, 37/26
U.S. Cl. 502—71 17 Claims

1. A method for enhancing the activity of a synthetic porous crystalline zeolite having a silica-to-alumina mole ratio greater than about 100 which comprises compositing same with alumina, reacting the composite with a dilute aqueous solution of hydrogen fluoride of from about 0.1 to about 5 Normal at a temperature of from about 0° C. to about 30° C. for a time of less than about 60 minutes, drying the hydrogen fluoride reacted composite, treating the dried hydrogen fluoride reacted composite by contact with an ammonium salt solution, by hydrolysis or ammonolysis, and calcining the resulting material at a temperature of from about 200° C. to about 600° C.

3. The method of claim 1 wherein said dried hydrogen fluoride reacted composite is treated by contact with an ammonium salt solution.

6. The method of claim 1 wherein said composite is formed as an extrudate prior to said reacting with a dilute aqueous solution of hydrogen fluoride.

13. The method of claim 1 wherein said zeolite is ZSM-5, ZSM-11, ZSM-12, ZSM-23, ZSM-35, ZSM-38 or ZSM-48.

4,427,788

ACTIVATION OF ZEOLITES

Joseph N. Miale, Lawrenceville, and Clarence D. Chang, Princeton, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Mar. 8, 1982, Ser. No. 355,415
Int. Cl.³ B01J 29/28, 37/26
U.S. Cl. 502—71 8 Claims

1. A method for enhancing the activity of a porous crystalline zeolite having a silica-to-alumina mole ratio of 70 or more which comprises impregnating the zeolite at a temperature of from about 0° C. to about 100° C. with an ammoniacal aluminum fluoride solution comprising from about 0.1 to about 5 weight percent of an aluminum fluoride in solution with at least one member selected from the group consisting of ammo-

nium hydroxide and ammonia, contacting the impregnated zeolite with a warm aqueous 0.1 to 2 Normal solution of an ammonium salt, and calcining the ammonium salt solution contacted material at a temperature of from about 200° C. to about 600° C.

3. The method of claim 1 wherein said zeolite has a silica-to-alumina mole ratio greater than about 500.

6. The method of claim 1 wherein said zeolite is ZSM-5, ZSM-11, ZSM-12, ZSM-23, ZSM-35, ZSM-38 or ZSM-48.

4,427,789

ACTIVATION OF ZEOLITES

Joseph N. Miale, Lawrenceville, and Clarence D. Chang, Princeton, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Mar. 8, 1982, Ser. No. 355,416
Int. Cl.³ B01J *29/28, 37/26*
U.S. Cl. 502—71 **14 Claims**

1. A method for enhancing the activity of a porous crystalline zeolite having a silica-to-alumina mole ratio greater than about 100 which comprises the steps of (1) compositing same with alumina, (2) impregnating the composite under a vacuum with an aqueous solution of an alkali metal fluoride, (3) contacting the impregnated composite with a warm aqueous solution of an ammonium salt, and (4) calcining the ammonium salt solution contacted material at a temperature of from about 200° C. to about 600° C.

7. A method for enhancing the activity of a porous crystalline zeolite having a silica-to-alumina mole ratio greater than about 100 which comprises the steps of (1) compositing same with alumina so that the composite comprises from about 25 weight percent to about 75 weight percent zeolite, (2) extruding the composite to form an extrudate thereof, (3) impregnating the extrudate under a vacuum with an aqueous solution of an alkali metal fluoride, (4) contacting the impregnated extrudate with a warm aqueous solution of an ammonium salt, and (5) calcining the ammonium salt solution contacted material at a temperature of from about 200° C. to about 600° C.

12. The method of claim 7 wherein said zeoite is ZSM-5, ZSM-11, ZSM-12, ZSM-23, ZSM-35, ZSM-38 or ZSM-48.

4,427,790

ACTIVATION OF ZEOLITES

Joseph N. Miale, Lawrenceville, and Clarence D. Chang, Princeton, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Mar. 8, 1982, Ser. No. 355,417
Int. Cl.³ B01J *29/28, 37/26*
U.S. Cl. 502—71 **16 Claims**

1. A method for enhancing the activity of a porous crystalline zeolite having a silica-to-alumina mole ratio greater than about 100 which comprises reacting said zeolite with a compound having the formula:

$$L_{(n-m)}[MF_n]_e$$

wherein L is an organic or inorganic ionic moiety, $[MF_n]$ is a fluoraonion moiety comprising the element M, M is an element selected from the group consisting of elements from Groups VB, VIB, VIIB, VIII, IIIA, IVA and VA of the Periodic Table of the Elements and Rare Earth elements, n is the coordination number of M, m is the valence of M and e is the charge associated with L, said reaction being conducted at a temperature of from about −70° C. to about 80° C. and a pressure of from about −0.8 psig to about 50 psig.

3. The method of claim 1 which comprises the additional step of hydrolyzing said zeolite reacted with said compound.

7. The method of claim 1 wherein said zeolite is ZSM-5, ZSM-11, ZSM-12, ZSM-23, ZSM-35, ZSM-38 or ZSM-48.

4,427,791

ACTIVATION OF INORGANIC OXIDES

Joseph N. Miale, Lawrenceville, and Clarence D. Chang, Princeton, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Mar. 8, 1982, Ser. No. 355,414
Int. Cl.³ B01J *21/02, 23/08*
U.S. Cl. 502—203 **9 Claims**

1. A method for enhancing the activity of an inorganic oxide material, which comprises contacting said material with a fluoride reagent selected from the group consisting of ammonium fluoride and boron fluoride at a temperature of from about 0° C. to about 100° C., contacting said fluoride reagent contacted material with an aqueous ammonium exchange solution and thereafter calcining said material at a temperature of from about 200° C. to about 600° C. in order to obtain an inorganic oxide material having enhanced activity.

4,427,792

IRON-PHOSPHORUS MIXED OXIDE CATALYSTS AND PROCESS FOR THEIR PREPARATION

S. Erik Pedersen, Mentor; Noel J. Bremer, Stow, and James L. Callahan, Wooster, all of Ohio, assignors to The Standard Oil Company, Cleveland, Ohio

Filed Aug. 10, 1981, Ser. No. 291,603
Int. Cl.³ B01J *27/18*
U.S. Cl. 502—210 **17 Claims**

1. A process for the preparation of iron phosphorus mixed oxide catalysts consisting essentially of

introducing an iron-containing compound and a phosphorus containing compound into a substantially organic liquid selected from alcohols and glycols to form a reaction mixture;

heating the reaction mixture to form an iron-phosphorus oxide catalyst precursor;

separating the catalyst precursor from the reaction mixture;

drying the catalyst precursor; and

calcining the precursor.

4,427,793

VINYLBENZYL ALCOHOL POLYMER BEADS AND THERMALLY CROSSLINKED DERIVATIVES THEREOF

Samuel F. Reed, Holland, Pa., and David L. Hundermark, Knoxville, Tenn., assignors to Rohm and Haas Company, Philadelphia, Pa.

Division of Ser. No. 115,861, Jan. 28, 1980, Pat. No. 4,384,095, which is a continuation of Ser. No. 927,225, Jul. 24, 1978, abandoned. This application Feb. 7, 1983, Ser. No. 464,190
Int. Cl.³ C08F *8/32*
U.S. Cl. 521—32 **11 Claims**

1. An ion exchange resin comprising lightly crosslinked beads of a linear addition polymer, said linear polymer containing repeating units of vinybenzyl alcohol and at least one other alpha,beta-monoethylenically unsaturated monomer different from vinylbenzyl alcohol, wherein the vinylbenzyl alcohol units comprise about 0.5% to about 20% by weight of the linear polymer and the crosslinks comprise alpha-hydroxy benzylic methylene links and/or benzyloxy links between aromatic rings of said vinylbenzyl alcohol units or between said aromatic rings and other active sites in said linear polymer, and wherein said crosslinked beads are functionalized to provide ion exchange properties.

4,427,794

PROCESS FOR THE PREPARATION OF BEAD POLYMERS OF UNIFORM PARTICLE SIZE BY POLYMERIZATION OF MICROENCAPSULATED MONOMER

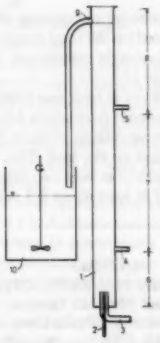
Peter M. Lange, Leverkusen, and Werner Strüver, Cologne, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Aug. 7, 1981, Ser. No. 290,982

Claims priority, application Fed. Rep. of Germany, Aug. 22, 1980, 3031737

Int. Cl.³ C08D 5/20

U.S. Cl. 521—28 9 Claims



1. A process for the preparation of bead polymers of improved uniform particle size and uniform quality, comprising

(a) in known manner producing droplets of uniform size from the monomer or polymerisation mixture to be polymerised by spraying these materials into a liquid which is continuously fed in and which is essentially immiscible with the monomer or polymerisation mixture;

(b) by means of coacervation, complex coacervation or by a phase interface reaction continuously encapsulating these droplets of uniform size in the said liquid according to processes of micro-encapsulation which are in themselves known either directly with shells which are stable under the polymerisation conditions to be used, or first with shells which are stable to shearing forces, and, in a second step, continuously or discontinuously hardening these shells which are stable to shearing forces to give shells which are stable under the polymerisation conditions to be used;

(c) polymerising the monomer droplets or droplets of polymerisation mixture encapsulated with shells which are stable under the polymerisation conditions to be used, with the provisions

(α) that the monomer or the polymerisation mixture is sprayed into the continuously fed-in continuous phase, co-current with this phase;

(β) that the production of the droplets and the encapsulation thereof are undertaken in different regions of a single reaction vessel;

(γ) that the process steps (a) and (b) are carried out in such a manner that no forces which alter the integrity of the droplets act on the droplets from their production until their encapsulation.

4,427,795

RIGID POLYVINYL CHLORIDE FOAM

Antoon Dorrestijn, Grevenbicht; Pieter J. Lemstra, Brunssum, and Lambert H. T. Van Unen, Heerlen, all of Netherlands, assignors to Stamicarbon B.V., Geleen, Netherlands

Continuation of Ser. No. 256,669, Apr. 22, 1981, abandoned. This application Dec. 14, 1982, Ser. No. 449,648

Claims priority, application Netherlands, Apr. 26, 1980, 8002463; Apr. 26, 1980, 8002464

Int. Cl.³ C08J 9/14

U.S. Cl. 521—134 10 Claims

1. New rigid polyvinyl chloride foam having a density of between 10 and 50 kg/m³ and having a uniform, fine-celled cell-structure with closed cells of which at least 95% have a cell diameter of at most 300 μm, consisting of a rigid vinyl chloride homopolymer containing per 100 parts by weight of polyvinyl chloride 0.1–15 parts by weight of a homo- or copolymer of an alkyl methacrylate having an alkyl group of 1–10 carbon atoms and foamed by use of a physical blowing agent.

4,427,796

WATER INSOLUBLE DISINFECTANT COMPOSITION

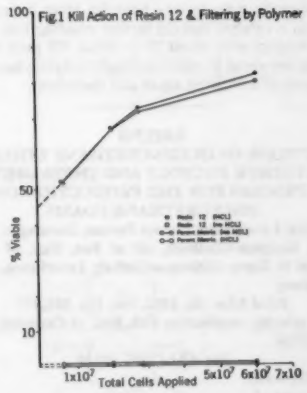
Ron Nudel, Brooklyn; Gilbert E. Janauer, Binghamton; Eugene E. Schrier, Vestal, and Ilona W. Figura, White Plains, all of N.Y., assignors to Research Foundation of the State University of New York, Albany, N.Y.

Division of Ser. No. 117,062, Jan. 31, 1982, Pat. No. 4,349,646. This application Jul. 28, 1982, Ser. No. 402,721

The portion of the term of this patent subsequent to Sep. 17, 1999, has been disclaimed.

Int. Cl.³ C08F 8/24, 8/32

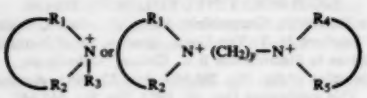
U.S. Cl. 521—139 6 Claims



1. A water insoluble disinfectant composition comprising a quaternary ammonium salt of the formula:

$$[Z_a + [Q]^{(+)n} X_{\frac{a}{n}}^{(-)n}$$

wherein a is a positive integer, n is an integer of 1–6, Q is a water insoluble cross linked resin of microporous or macroporous structure selected from the group consisting of polystyrene resins having methylene moieties attached to the backbone thereof, and polymethyl methacrylate resins, X is the anion of any physiologically acceptable salts, and Z is



wherein R_1 and R_2 are selected from the group consisting of straight or branch chain lower alkyl of one to eight carbon atoms, straight or branch chain lower alkenyl of two to eight carbon atoms, lower cycloalkyl of three to six carbon atoms and taken together with the nitrogen to which they are attached, form a saturated or unsaturated heterocycle having five to seven carbon atoms in the ring, R_3 is straight or branch chain midalkyl of ten to sixteen carbon atoms, phenyl, halo or lower alkyl substituted phenyl, naphthyl lower alkyl and halo or lower alkyl substituted naphthyl lower alkyl wherein said lower alkyl moieties are of one to five carbon atoms and are substituted on from one to five positions on the phenyl nucleus and from one to seven positions on the naphthyl nucleus, R_4 and R_5 are selected from the same group of values as R_1 and R_2, y is a positive integer of 1-20, provided that where R_1, N, and R_2 are joined to form a fully unsatured heterocycle, R_3 is absent and Z is bonded to the methylene moieties.

4,427,797

NON-BURNING, NON-SMOKING THERMOSET FOAM COMPOSITION

Stuart B. Smith, Conyers, Ga., assignor to Thermocell Development Ltd., Knoxville, Tenn.

Continuation-in-part of Ser. No. 272,008, Jun. 9, 1981, abandoned. This application Apr. 26, 1982, Ser. No. 371,983

Int. Cl.³ C08G *18/14, 18/32*

U.S. Cl. 521—166 **10 Claims**

1. A foam composition obtained by (a) first forming a pre-blend reaction product by reacting about 200 to about 250 parts by weight melamine with about 20 to about 100 parts by weight phenolic resin having benzylic ether linkages in the presence of a catalyst and (b) further reacting said pre-blend reaction product with about 20 to about 100 parts by weight isocyanate and about 20 parts by weight polyethylene glycol in the presence of a blowing agent and surfactant.

4,427,798

SOLUTIONS OF OLIGO-URETHANE ETHERS IN POLYETHER POLYOLS AND THEIR USE IN A PROCESS FOR THE PRODUCTION OF POLYURETHANE FOAMS

Klaus König, Leverkusen; Gernot Becker, Dormagen, and Peter Seifert, Bergisch-Gladbach, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Mar. 10, 1982, Ser. No. 356,877

Claims priority, application Fed. Rep. of Germany, Mar. 19, 1981, 3110724

Int. Cl.³ C08G *18/14*

U.S. Cl. 521—173 **4 Claims**

1. Solutions of

(A) from 3 to 60%, by weight, based on the combined ether-polyol content, of separately prepared oligo-urethane ethers containing terminal OH-groups in the form of reaction products of

(a) diisocyanates with

(b) short-chain polyether diols having an average molecular weight of from 200 to 800, the stoichiometric ratio of (a) to (b) amounting to between 0.5 and 0.7 in the case of diols having an average molecular weight of from 200 to 280; to between 0.5 and 0.9 in the case of diols having an average molecular weight in the range from 280 to 600; and to between 0.5 and 0.75 in the case of diols having an average molecular weight of from 600 to 800,

in

(B) polyether polyols containing at least two hydroxyl groups and having an average molecular weight from 1000 to 12,000.

4,427,799

DENTAL RESTORING MATERIAL AND A FILLER THEREFOR

Jan A. Orlowski, Altadena, and David V. Butler, West Covina, both of Calif., assignors to Blendax-Werke R. Schneider GmbH & Co., Mainz, Fed. Rep. of Germany

Filed Sep. 23, 1981, Ser. No. 304,647

Claims priority, application European Pat. Off., Mar. 24, 1981, 81102198.9

Int. Cl.³ C08L *33/10*; C08K *3/36*

U.S. Cl. 523—116 **8 Claims**

1. Dental restoring material comprising about 50 to about 88% by weight, calculated on the total composition, of a filler and at least one polymerizable compound, characterized in that the filler is a mixture of

(a) 8 to 60% by weight of at least one silanized filler with a medium particle diameter from about 5 to about 300 millimicrons and an organosilicon content from about 5 to about 25%, calculated on the total filler, and

(b) 40 to 92% by weight of at least one filler with a medium particle diameter of at least about 0.5 microns.

4,427,800

PHENOLIC RESIN FOR REFRACTORY USES

Masayuki Nakamura, and Masaaki Tsuriya, both of Fujieda, Japan, assignors to Sumitomo Durez Company, Ltd., Japan

Filed Feb. 12, 1982, Ser. No. 348,554

Claims priority, application Japan, Feb. 18, 1981, 56-45446

Int. Cl.³ B22C *11/22*

U.S. Cl. 523—145 **8 Claims**

1. A phenolic resin for refractory uses, consisting essentially of a liquid phenolic resole resin having a methylol group index of about 0.8 or less.

4,427,801

EXTRUDABLE SILICONE ELASTOMER COMPOSITIONS

Randall P. Sweet, Midland, Mich., assignor to Dow Corning Corporation, Midland, Mich.

Continuation of Ser. No. 368,331, Apr. 14, 1982, abandoned. This application Jun. 3, 1983, Ser. No. 500,012

Int. Cl.³ C08L *83/04*

U.S. Cl. 523—212 **20 Claims**

1. An elastomeric organopolysiloxane obtained by curing an extrudable, curable composition consisting essentially of

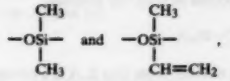
(1) 100 parts by weight of a liquid triorganosiloxy end-blocked polydiorganosiloxane exhibiting a viscosity of from 5,000 to 200,000 centipoises at 25° C., wherein the triorganosiloxy groups are vinyldimethylsiloxy or vinylmethylphenylsiloxy and at least 95% of the diorganosiloxane groups are dimethylsiloxane;

(2) from 20 to 60 parts by weight of finely divided amorphous silica particles having a surface area greater than 100 square meters per gram, wherein at least a portion of the silicon atoms on the surface of the particles are bonded to trimethylsiloxy groups and vinyl-containing siloxy groups selected from the group consisting of

(a) $CH_2{=}CH(CH_3)_2SiO[(CH_3)_2SiO]_x$

(b) $CH_2{=}CH(CH_3)(C_6H_5)SiO[(CH_3)_2SiO]_x$ where the average value of x is from 0 to 20, and

(c) organosiloxy groups consisting essentially of repeating units of the general formulae



the total number of repeating units in each organosiloxy group being from 2 to about 20, and the molar ratio of dimethylsiloxy units to methylvinylsiloxy units having an average value of from 1:1 to 5:1, the relative concentrations of trimethylsiloxy and vinyl-containing siloxy groups being sufficient to provide (1) from 0.01 to 0.5 percent of vinyl groups, based on the weight of silica, and (2) from 1 to 100 moles of trimethylsiloxy groups for each mole of vinyl-containing siloxy groups;

(3) from 10 to 50 parts of a organopolysiloxane resin consisting essentially of

(d) $R_2^1(CH_2{=}CH{-})SiO_{0.5}$ units,

(e) $R_3^2SiO_{0.5}$ units and

(f) $SiO_{4/2}$ units wherein the molar ratio of the combination of (d) and (e) units to (f) units is from 0.6 to 1.1, and the concentration of (d) units is from 0.2 to 8% based on the weight of said organopolysiloxane resin, and R^1 and R^2 are alkyl containing from 1 to 4 carbon atoms or phenyl, with the proviso that at least 95% of the R^1 and R^2 groups are methyl;

(4) a liquid organohydrogensiloxane in an amount sufficient to provide from 1 to 3 silicon-bonded hydrogen atoms per vinyl group present in components (1), (2) and (3) combined, said organohydrogensiloxane having an average of at least three silicon-bonded hydrogen atoms per molecule and consisting essentially of units selected from the group consisting of methylhydrogensiloxy, dimethylsiloxy, dimethylhydrogensiloxy, trimethylsiloxy and $SiO_{4/2}$ units; and

(5) a platinum-containing catalyst in sufficient amount to provide at least 0.1 part by weight of platinum per million parts by weight of said triorganosiloxy endblocked polydiorganosiloxane.

4,427,802

HETEROCYCLIC MULTIFUNCTIONAL AMINE ADDUCTS AND CURABLE COMPOSITIONS CONTAINING THE SAME

Richard J. Moulton, Clayton, and John D. Neuner, Pittsburg, both of Calif., assignors to Hexcel Corporation, San Francisco, Calif.

Filed Jul. 27, 1981, Ser. No. 286,897

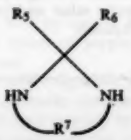
Int. Cl.³ C08K *3/04, 3/36;* **C08G** *59/00, 59/50*

U.S. Cl. 523—222 **26 Claims**

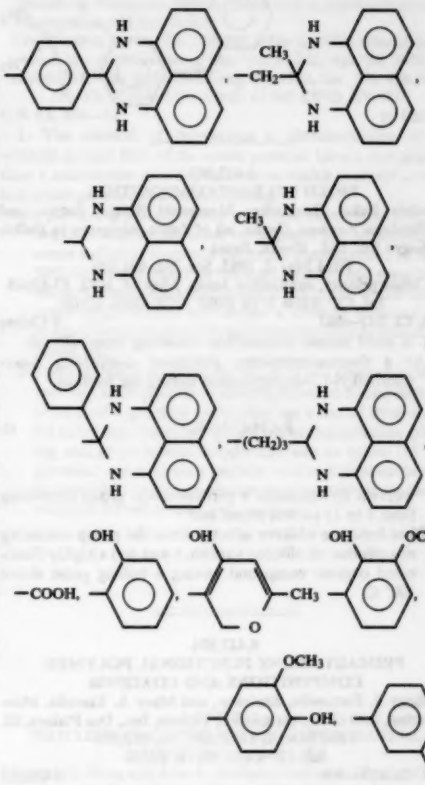
1. A curable composition comprising:

(A) an epoxy resin; and

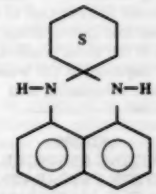
(B) a heterocyclic compound having the formula:



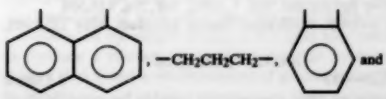
wherein R_5 and R_6 are each independently selected from the group consisting of hydrogen, alkyl, phenyl,



and R_5 and R_6 may jointly form



and R_7 is selected from the group consisting of



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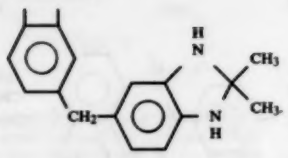


4,427,803

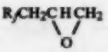
MOLD RELEASE COMPOSITION

Shoshin Fukui, Toyonaka; Masayoshi Shinjo, Settsu, and Hirokazu Aoyama, Osaka, all of Japan, assignors to Daikin Kogyo Co., Ltd., Osaka, Japan

Filed May 3, 1983, Ser. No. 491,236
Claims priority, application Japan, May 14, 1982, 57-82165
Int. Cl.³ B28B 7/36; C08J 3/18; C08L 63/00
U.S. Cl. 523—402 9 Claims

1. A mold release composition consisting essentially of:

(A) a fluorine-containing polyether comprising 3-perfluoroalkyl-1,2-epoxypropane having the formula



(I)

wherein R_f represents a perfluoroalkyl group containing from 5 to 13 carbon atoms and

(B) at least one additive selected from the group consisting of a silicone oil, silicone varnish, a wax and a highly fluorinated organic compound having a boiling point above 100° C.

4,427,804

PRIMARY AMINE FUNCTIONAL POLYMER COMPOSITIONS AND COATINGS

Anthony J. Tortorello, Elmhurst, and Mary A. Kinsella, Manhattan, both of Ill., assignors to DeSoto, Inc., Des Plaines, Ill.

Filed Mar. 1, 1982, Ser. No. 353,099
Int. Cl.³ C08L 63/10, 63/02
U.S. Cl. 523—404 8 Claims

1. An emulsion of a liquid polyepoxide polymer in a water solution of a monosecondary amine containing at least one primary amine group which is ketimine blocked by reaction with a ketone which is hindered to prevent reaction with a secondary amino hydrogen atom, said hindered ketone being selected from the group consisting of noncyclic ketones containing one group selected from methyl or ethyl and a second group containing at least four carbon atoms, and cyclic ketones which are substituted in the alpha position, and said monosecondary amine being dispersed in the water of said emulsion with the aid of a volatile solubilizing acid.

4,427,805

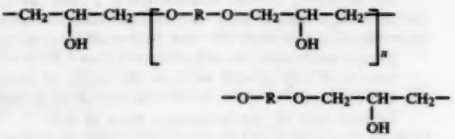
THERMOSETTING RESINOUS BINDER COMPOSITIONS, THEIR PREPARATION AND USE AS COATING MATERIALS

Petrus G. Kooijmans; Werner T. Raudenbusch; Adrianus M. C. Van Steenis; Wolfgang Kunze, and Josepha M. E. Seelen-Kruijssen, all of Amsterdam, Netherlands, assignors to Shell Oil Company, Houston, Tex.

Division of Ser. No. 255,196, Apr. 20, 1981, Pat. No. 4,362,847. This application Sep. 7, 1982, Ser. No. 415,506
Claims priority, application United Kingdom, May 22, 1980, 8016916
Int. Cl.³ C08L 63/02
U.S. Cl. 523—417 8 Claims

1. An aqueous paint composition suitable for cathodic electrodeposition comprising a binder comprising (1) a non-acidic resinous compound having the formula:

wherein m is a number from 0 to 2, A is a group which is linked to B through a tertiary amino function and being derived from an amine having one secondary amino group, B is a group



wherein n is a number from 0 to 4, R is a hydrocarbon radical of a dihydric phenol, and C is a group which is linked to B through two tertiary amino functions and being derived from an amine containing at least two secondary amino groups or a primary mono-amino groups, (2) a non-acidic polyester prepared by reacting a polycarboxylic acid or anhydride thereof with at least one hydroxyl-containing compound selected from the groups consisting of glycols, glycol mono-ethers and polyols, and (3) a polyvalent metal compound, said binder having from about 20% to about 100% of the amino groups neutralized with a carboxylic acid.

4,427,806

POWDER COMPOSITION FOR PREPARING SELF-EXTINGUISHING COATINGS

Sergio Zanvettor, Belluno, Italy, assignor to Ducati Elettrotecnica S.p.A., Bologna, Italy

Filed Feb. 10, 1982, Ser. No. 347,505
Claims priority, application Italy, Feb. 19, 1981, 45707 A/81
Int. Cl.³ C08K 3/22
U.S. Cl. 523—460 6 Claims

1. In a powder composition for preparing self-extinguishing coatings, comprising a solid epoxy resin, a fluidizing agent, a hardening agent, a catalyst, a pigment and a filler, the improvement wherein the composition does not contain any halogen or halogen-containing substance, and the filler is an inorganic filler containing $Al(OH)_3$ capable of producing a non-toxic substance capable of exhibiting a self-extinguishing function.

4,427,807

GLASS REINFORCED POLY(OXYMETHYLENE) COMPOSITION HAVING IMPROVED PROPERTY RETENTION

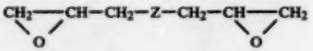
Daniel Zimmerman, East Brunswick, and Shau-Zou Lu, Whitehouse Station, both of N.J., assignors to Celanese Corporation, New York, N.Y.

Filed Oct. 22, 1982, Ser. No. 436,156
Int. Cl.³ C08K 3/40
U.S. Cl. 523—466 11 Claims

1. A glass reinforced molding composition comprising

(i) from about 50 to 95 weight percent of a copolymer of trioxane and a cyclic ether, cyclic acetal or linear polyacetal;

(ii) from about 5 to about 50 weight percent of a terpolymer of trioxane, a cyclic ether and/or cyclic acetal and a diglycide of the formula



wherein Z is a carbon-to-carbon bond, an oxygen, an oxy-alkoxy of 1 to 8 carbon atoms or an oxy-poly(lower alkoxy), and

(iii) a glass reinforcing agent in an amount ranging from about 0.1 to 50 weight percent based upon the total weight of components (i) and (ii).

4,427,808

COMPOSITE POLYMERIC MATERIAL FOR BIOLOGICAL AND MEDICAL APPLICATIONS AND THE METHOD FOR ITS PREPARATION

Miroslav Stol; Miroslav Tolar; Milan Adam; Pavel Cefelin, and Jaroslav Kalal, all of Prague, Czechoslovakia, assignors to Ceskoslovenska akademie ved, Prague, Czechoslovakia

Filed Jul. 15, 1981, Ser. No. 283,424

Claims priority, application Czechoslovakia, Jul. 21, 1980, 5125-80

Int. Cl.³ C07G 7/00; C08L 89/06; G02C 7/04

U.S. Cl. 524—24 3 Claims

3. The method according to claim 2, wherein a biologically active compound, and if it is desired, a filler and/or a plasticizer are added during the preparation of dispersion or after the lyotropic agent has been removed.

4,427,809

THERMOPLASTIC MOULDING COMPOSITIONS OF CO-GRAFT POLYMERS

Heinrich Alberts, Cologne, Fed. Rep. of Germany; Winfried Fischer, Tokyo, Japan, and Christian Leuschke, Dormagen, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Dec. 14, 1981, Ser. No. 330,085

Claims priority, application Fed. Rep. of Germany, Dec. 23, 1980, 3048697

Int. Cl.³ C08L 51/00, 51/02; C08J 5/00, 5/18

U.S. Cl. 524—37 1 Claim

1. Thermoplastic moulding compositions, consisting of the following:

I. from 50 to 99% by weight of a cellulose ester of one or more aliphatic C_1–C_5 carboxylic acids, and

II. from 50 to 1% by weight of a co-graft polymer consisting of the following:

(1) from 15 to 95% by weight of a graft substrate composed of the following:

(a) from 50 to 97% by weight of an elastomer having a glass transition temperature of $\leqq 0°$ C., said elastomer being an ethylenevinyl acetate copolymer containing from 5 to 75% by weight of vinyl acetate

(b) from 3 to 50% by weight of one or more polyesters, polyethers, poluesterurethanes, polyetherurethanes, polycarbonates or mixtures thereof, and

(c) from 0 to 45% by weight of a cellulose ester of one or more aliphatic C_1–C_5 carboxylic acids, and

(2) from 85 to 5% by weight of polymerized units of the following:

(a) from 100 to 80% by weight of vinyl esters and/or C_1–C_{18} alkyl esters of acrylic acid and/or methacrylic acid, and

(b) from 0 to 20% by weight of C_2–C_4-α-olefins, at least some of the polymeric components of the graft substrate being bridged together by polymerized units of the graft monomers, and the total of components I and II, 1 and 2, (1a) to (1c) and (2a) and (2b) in each case being 100% by weight.

4,427,810

CONTINUOUS METHOD OF PRODUCING AQUEOUS PHTHALOCYANINE PIGMENT DISPERSIONS

Dominick Chiavette, Colonia; James Lattimore, Paterson, and Donald M. Patterson, Milton, all of N.J., assignors to Inmont Corporation, Clifton, N.J.

Continuation of Ser. No. 259,890, May 4, 1981, abandoned, which is a continuation of Ser. No. 33,662, Apr. 26, 1979, abandoned. This application Aug. 17, 1982, Ser. No. 408,956

Int. Cl.³ C08K 5/34; C09D 11/00; C07D 207/00

U.S. Cl. 524—88 14 Claims

1. The method of converting a phthalocyanine crude wherein at least 80% of the crude particles have a size greater than 1 micrometer to a dispersed form which is useful in inks and coatings, said method comprising

(A) premixing phthalo crude with from about 12 to 30% by weight of surfactant based on pigment and an amount of water sufficient to reduce the crude concentration to 10 to 50% by weight, based on the total mixture, said premixing being accomplished by agitation to break down loose crude agglomerates and obtain a uniform blend of the crude without appreciably reducing the particle size of the crude, and

(B) continuously pumping the blend of (A) through at least two shot mills in series containing between 50 and 90% by volume of a grinding media that has a size of from about 0.1 to 1.5 mm. diameter thereby imparting sufficient grinding energy to reduce the particle size to below 0.5 micrometer and coat each particle with sufficient surfactant to provide a stable dispersion having suitable tinctorial strength for use in inks and coatings.

4,427,811

SILICONE ELASTOMERIC EMULSION HAVING IMPROVED SHELF LIFE

Michael G. Elias, and Alan L. Freiberg, both of Midland, Mich., assignors to Dow Corning Corporation, Midland, Mich.

Continuation-in-part of Ser. No. 335,952, Dec. 30, 1981, abandoned. This application Sep. 24, 1982, Ser. No. 422,805

Int. Cl.³ C08L 83/04; C08K 5/57, 5/17

U.S. Cl. 524—96 24 Claims

1. A method of improving the shelf life of a silicone elastomeric emulsion which comprises an anionically stabilized, hydroxyl endblocked polydiorganosiloxane, colloidal silica, an alkyl tin salt, and filler other than colloidal silica comprising preparing the silicone elastomeric emulsion by

(I) mixing

(A) 100 parts by weight of an anionically stabilized, hydroxyl endblocked polydiorganosiloxane having a weight average molecular weight of greater than 50,000, present as an oil-in-water emulsion,

(B) from 1 to 100 parts by weight of colloidal silica, and

(C) from 0.1 to 1.5 parts by weight of alkyl tin salt,

adjusting to a pH of greater than 9, withholding the filler other than colloidal silica, to give a base emulsion,

(II) aging the base emulsion for at least 2 weeks at room temperature, then

(III) mixing the aged base emulsion with from 10 to 200 parts by weight of filler other than colloidal silica based upon 100 parts by weight of (A) in the aged base emulsion,

to produce a silicone elastomeric emulsion having a pH of greater than 9 and a solids content of greater than 40 percent by weight.

4,427,812
INTERFACIAL VISCOSIFICATION OF SALT WATER SYSTEMS UTILIZING SULFONATED IONOMERS

Dennis G. Peiffer, East Brunswick; Robert D. Lundberg, Bridgewater, both of N.J., and Thad O. Walker, Humble, Tex., assignors to Exxon Research and Engineering Co., Florham Park, N.J.

Filed May 3, 1982, Ser. No. 374,251
Int. Cl.³ C08L 91/00
U.S. Cl. 524—115 **19 Claims**

1. A process for forming a thickened salt water solution having a viscosity of at least about 50 cps which includes the steps of:

(a) forming a solvent system of an organic liquid and a polar cosolvent, said polar cosolvent being less than about 15 weight percent of said solvent system, the viscosity of said solvent system being less than about 100 cps;

(b) dissolving a water insoluble unneutralized or neutralized sulfonated polymer in said solvent system to form a solution, the concentration of said unneutralized or neutralized sulfonated polymer in said solution being about 0.01 to about 0.5 weight percent, the viscosity of said solution being less than about 200 cps;

(c) dissolving a nonionic surfactant in said solution, the concentration of said nonionic surfactant being about 0.0001 to about 1.0 weight percent; and

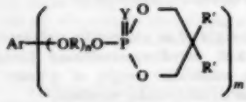
(d) adding about 5 to about 500 volume percent of salt water to said solution, said water and said solution being immiscible, said polar cosolvent, said nonionic surfactant and said water insoluble, neutralized or unneutralized sulfonated polymer transferring from said organic liquid to said salt water thereby causing the viscosity of said salt water to increase to at least 50 cps.

4,427,813
POLYCARBONATE CONTAINING A BIS(CYCLIC PHOSPHATE) AS A THERMAL STABILIZER

Gerald K. McEwen, and Lowell S. Thomas, both of Midland, Mich., assignors to The Dow Chemical Co., Midland, Mich.

Filed Dec. 14, 1981, Ser. No. 330,752
The portion of the term of this patent subsequent to Mar. 3, 1998, has been disclaimed.
Int. Cl.³ C08K 5/52; C07F 9/15
U.S. Cl. 524—119 **8 Claims**

1. An aromatic bis(dioxaphosphorinane) represented by the formula:



wherein Ar is a divalent aromatic radical having each of its valences on an aromatic ring; Y is oxygen or sulfur; n is 0 or a whole number up to 10; m is a whole number from 1 to 3; each R is individually a divalent aliphatic radical and each R' is individually hydrogen or a monovalent organic radical provided that the aromatic bis(di-Y-dioxaphosphorinane) is inert to the polycarbonate.

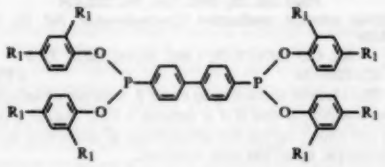
4. A polycarbonate composition comprising a carbonate polymer having dispersed therein the aromatic bis(dioxaphosphorinane) of claim 1 in an amount sufficient to measurably increase the thermal stability of the carbonate polymer.

4,427,814
POLYPHENYLENE ETHER RESIN COMPOSITION HAVING IMPROVED HEAT STABILITY

Akitoshi Sugio, Ohmiya; Masanobu Masu, Tokyo; Masao Okabe, Ahiko; Yukio Sasaki, Tokyo, and Kozo Ishiyama, Yokkaichi, all of Japan, assignors to Mitsubishi Gas Chemical Company, Inc., Japan

Continuation-in-part of Ser. No. 240,367, Mar. 4, 1981, abandoned. This application Mar. 15, 1983, Ser. No. 476,016
Claims priority, application Japan, Mar. 10, 1980, 55-30051
Int. Cl.³ C08K 5/50, 5/53
U.S. Cl. 524—126 **14 Claims**

1. A polyphenylene ether resin composition having improved heat stability and good color, said composition comprising a polyphenylene ether resin matrix, and dispersed therein, a diphosphonite of the formula



wherein R_1 groups are identical or different and each represents a linear or branched alkyl group having 1 to 10 carbon atoms.

4,427,815
FIBER-TREATING COMPOSITIONS COMPRISING TWO ORGANOFUNCTIONAL POLYSILOXANES

Isao Ona, Sodegaura; Masaru Ozaki, and Yoichiro Taki, both of Ichihara, all of Japan, assignors to Toray Silicone Company, Ltd., Tokyo, Japan

Filed Jul. 2, 1982, Ser. No. 394,966
Int. Cl.³ C04B 31/00; C08L 83/04; C08K 5/01; D06M 15/66
U.S. Cl. 524—315 **6 Claims**

1. A composition for treating fibers, said composition comprising an organopolysiloxane component (A) having the formula

$$A(R_2SiO)_k(RSiO)_mSiR_2A$$
$$\quad\quad\quad

R denotes a substituted or unsubstituted monovalent hydrocarbon group;
R^1 denotes a divalent hydrocarbon group;
R^2 denotes a hydrogen atom or a monovalent hydrocarbon group;
R^3 denotes a divalent hydrocarbon group;
R^4 denotes a hydrogen atom or a monovalent hydrocarbon group;
R^5 denotes a divalent organic group;
R^6 denotes a hydrogen atom or a terminating group;
R^7 denotes a divalent organic group;
a has a value of from 0 to 10;
b has a value of 0 or 1;
c has a value of from 0 to 50;
d has a value of from 0 to 50;
c+d has a value of from 1 to 100;
k has a value of from 0 to 2000;
m has a value of from 0 to 200;
k+m has a value of from 1 to 2000;
p has a value of from 0 to 1000;
q has a value of from 0 to 100;
r has a value of from 0 to 100;
p+q+r has a value of from 2 to 1000;
x has a value of from 0 to 1000;
y has a value of from 0 to 100;
z has a value of from 0 to 100;
x+y+z has a value of from 2 to 1000;

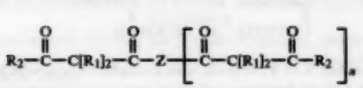
there being at least two R^1COOR^2 groups per molecule of component (A), at least two $R^3(NHCH_2CH_2)_aNHR^4$ groups and at least one G group per molecule of component (B) and at least two E groups and at least one G group per molecule of component (C).

4,427,816
β-DIKETONE AND HYDROTALCITE STABILIZER COMPOSITIONS FOR HALOGEN-CONTAINING POLYMERS AND POLYMER COMPOSITIONS CONTAINING THE SAME

Toshihiro Aoki, Tokyo, and Yoshio Iida, Urawa, both of Japan, assignors to Adeka Argus Chemical Co., Ltd., Urawa, Japan

Continuation-in-part of Ser. No. 319,815, Nov. 9, 1981, abandoned. This application Jan. 29, 1982, Ser. No. 344,100
Claims priority, application Japan, Nov. 7, 1980, 55-156503
Int. Cl.³ C08K *3/30, 3/26*
U.S. Cl. 524—357 **28 Claims**

1. A stabilizer composition for halogen-containing polymers are provided composed of at least one member of the group consisting of β-diketones having the formula:



wherein:

R_1 is selected from the group consisting of hydrogen, hydrocarbon groups having from one to about eighteen carbon atoms and such groups substituted with one or more groups selected from the group consisting of halogen, hydroxy, alkoxy OR_1, ester $COOR_1$, alkyl and alkoxycarbonyl alkyl having from one to about eighteen carbon atoms, and

R_2 is selected from the group consisting of hydrogen; hydroxyl; hydrocarbon having from one to about eighteen carbon atoms and such hydrocarbon groups substituted with one or more groups selected from the group consisting of halogen, hydroxy, alkoxy OR_1, ester $COOR_1$, alkyl and alkoxycarbonyl having from one to about eighteen carbon atoms; but if Z is R_2 or n is 1 to 3, then no more than one R_2 is hydrogen;

one R_1 and one R_2 or two R_2 may be linked together as an alkylene group to form a cyclic or ring structure;

n is a number from 0 to 3; and

Z is selected from the group consisting of R_2 and a polyvalent linking radical selected from the group consisting of a direct linkage between the

groups;

polyvalent hydrocarbon R_3;

wherein:

R_3 is a polyvalent hydrocarbon group having from one to about eighteen carbon atoms;

R_4 and R_5 are selected from the group consisting of hydrogen and hydrocarbon groups having from one to about eighteen carbon atoms; and R_4 and R_5 may be linked together as an alkylene to form a cyclic or ring structure;

X is —O— or —S—;

m is 0 or 1; and

R_6 is selected from the group consisting of hydrogen, hydrocarbon having from one to about eighteen carbon atoms, and $—R_3—$;

and metal and organotin enolate salts thereof; and a hydrotalcite having the general formula:

$$Mg_{1-x}Al_x(OH)_2A_{x/2}.m_1H_2O$$

wherein

x is a number from 0 to 0.5;

A is $CO_3^=$ or $SO_4^=$, and

m_1 is a number representing the number of H_2O in the molecule.

25. A polyvinyl halide resin composition having improved resistance to deterioration when heated at 350° F., comprising a polyvinyl halide resin formed at least in part of the recurring group:

and having a halogen content in excess of 40%, where X_1 is halogen and X_2 is either hydrogen or halogen and a stabilizer composition according to claim 1.

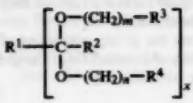
4,427,817
OPEN-CHAIN ACETALS OR KETALS AS NON-DISCOLORING ANTIOZONANTS FOR RUBBER

Dieter W. Brück, Cologne; Werner Jeblick, Leverkusen; Heinrich Königshofen, Bergisch Gladbach; Ernst Roos, Odenthal, and Lother Ruetz, Dormagen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Apr. 6, 1982, Ser. No. 365,988
Claims priority, application Fed. Rep. of Germany, Apr. 10, 1981, 3114639
Int. Cl.³ C08K *5/06*
U.S. Cl. 524—367 **4 Claims**

1. Process for stabilising natural and/or synthetic rubber against ozone attack by incorporating into rubber an antiozo-

nant whereby as an antiozonant open-chain acetals or ketals corresponding to the following general formula:



in which

n and m are the same or different and represent integers of from 0 to 12;

x = 1 or 2;

R^1 and R^2 are the same or different and represent hydrogen, C_1–C_3-alkyl or alkylene optionally substituted one or more times by halogen and/or C_1–C_4-alkyl; C_1–C_6-alken-(dien)-yl or alken(dien)ylene optionally substituted one or more times by halogen and/or C_1–C_4-alkyl; C_5–C_7-cyclo- or bicyclo-alkenyl or alkylene optionally substituted one or more times by halogen and/or C_1–C_4-alkyl; C_6–C_{10}-aryl or arylene optionally substituted one or more times by halogen and/or C_1–C_4-alkyl and/or C_1–C_4-alkoxy, C_7–C_9-alkylaryl or alkylarylene optionally substituted one or more times by halogen and/or C_1–C_4-alkyl and/or alkoxy, C_5–C_6-heteroaryl containing one or more O, S, N atoms as heteroatom(s),

R^3 and R^4 are the same or different, and have the same meaning as R^1 and R^2 with at least one of the radicals R^1, R^2, R^3 or R^4 representing a cyclic or bicyclic unsaturated C_5–C_7-radical, are used.

4,427,818

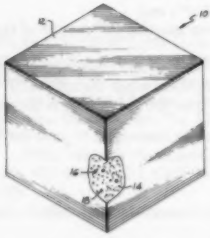
THERMOPLASTIC POLYMER CONCRETE STRUCTURE AND METHOD

Richard C. Prusinski, 7533 Hartwell, Dearborn, Mich. 48126

Filed May 15, 1981, Ser. No. 264,038

Int. Cl.³ B32B *27/20*

U.S. Cl. 524—442 **4 Claims**



1. A polymer structure comprising a mixture of precontaminated otherwise unusable, unrecyclable, thermoplastic, offal, scrap plastic, resins and fillers therefor having the approximate composition of 25% ABS, 25% sand, 25% low density polyethylene and 25% high density polyethylene by weight, which polymer structure results from heating the resins, mixing the fillers therein and allowing the mixture to cool in a mold form.

4,427,819

ANIONIC STRUCTURED PARTICLE LATEXES

Ritchie A. Wessling, Midland, and Dale M. Pickelman, Auburn, both of Mich., assignors to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 162,289, Jun. 23, 1980, Pat. No. 4,337,185. This application Jun. 14, 1982, Ser. No. 388,065

Int. Cl.³ C08L *41/00*

U.S. Cl. 524—458 **2 Claims**

1. An aqueous colloidal dispersion of anionic structured particles of organic polymer consisting of a nonionic polymer core encapsulated by a thin layer of a water-insoluble copolymer having pH independent anionic groups chemically bound to the copolymer at or near the particle surface; said anionic groups being present in an amount from about 0.15 milliequivalent to about 0.35 milliequivalent per gram of structured particles.

4,427,820

PRODUCTION OF POLYMER MICROPARTICLES AND COATING COMPOSITIONS CONTAINING THEM

Alan J. Backhouse, South Ascot; Stephen J. Thorne, Henley-on-Thames, and Patrick A. Hunt, Welwyn Garden City, all of England, assignors to Imperial Chemical Industries PLC, London, England

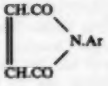
Continuation-in-part of Ser. No. 212,752, Dec. 4, 1980, abandoned. This application Jun. 9, 1982, Ser. No. 386,635

Claims priority, application United Kingdom, Dec. 21, 1979, 7944210

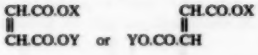
Int. Cl.³ C08J *3/02, 3/08;* C08K *5/01;* C08L *51/08*

U.S. Cl. 524—504 **24 Claims**

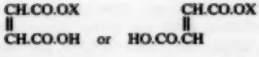
1. A process for the production of a dispersion of addition polymer microparticles, of a size in the range 100–400 nm, the process comprising the dispersion polymerization in an aliphatic hydrocarbon liquid of an ethylenically unsaturated monomer mixture which gives rise to a copolymer insoluble in the hydrocarbon liquid and which comprises (i) up to 50% by weight of styrene or a substituted derivative thereof and (ii) up to 50% by weight of a derivative of maleic acid or fumaric acid which is per se soluble in the hydrocarbon liquid at the temperature of polymerization, said derivative being selected from the group consisting of an N-aryl-substituted maleimide of the general formula



where Ar is an aromatic radical which may contain a single benzene nucleus or two or more connected or fused benzene nuclei, a diester of maleic acid or fumaric acid of the structure



where either X or Y, or both, is an aromatic radical which may contain a single benzene nucleus or two or more connected or fused benzene nuclei, and a monoester of maleic acid or fumaric acid of the structure



where X is an aromatic radical which may contain a single benzene nucleus or two or more connected or fused benzene nuclei, the polymerization being carried out in the presence in the hydrocarbon liquid of a steric dispersion stabilizer the molecule of which comprises at least one polymeric component which is solvated by the hydrocarbon liquid and at least one other component which is not solvated by the liquid and is capable of associating with the copolymer produced, and the concentration of unpolymerized monomer in the hydrocarbon liquid being regulated so that throughout the polymerization the reaction medium remains a non-solvent for the copolymer formed.

4,427,821

HYDROGENATION OF RESIDUAL MONOMERS IN PARTIALLY POLYMERIZED ACRYLAMIDE COPOLYMERS IN LATEX FORM

Dodd W. Fong, and Ronald J. Allain, both of Naperville, Ill., assignors to Nalco Chemical Company, Oak Brook, Ill.

Continuation of Ser. No. 289,637, Aug. 3, 1981. This application Nov. 22, 1982, Ser. No. 443,270

Int. Cl.³ C08F 6/14

U.S. Cl. 524—555 4 Claims

1. A method of reducing the monomer content of water-in-oil emulsions of partially polymerized acrylamide polymers containing at least 5% by weight acrylamide which comprises hydrogenating the unpolymerized monomer contained in the water-in-oil emulsion in the presence of a double bond hydrogenation catalyst at a temperature not greater than 100° C. and at a pressure below 500 psi, said hydrogenation catalyst not disturbing the stability of the water-in-oil emulsion being treated.

4,427,822

PROCESS FOR PRODUCING PARTICULATE POLYMER HAVING IMIDE GROUPS

Hiroshi Nishizawa, Kitaibaraki; Yoshiyuki Mukoyama, and Osamu Hirai, both of Hitachi, all of Japan, assignors to Hitachi Chemical Co., Ltd., Tokyo, Japan

Filed Nov. 10, 1982, Ser. No. 440,570

Claims priority, application Japan, Feb. 15, 1982, 57-23271; Mar. 11, 1982, 57-39115

Int. Cl.³ C08G 18/00

U.S. Cl. 524—726 15 Claims

1. A process for producing a particulate polymer which may be in gelled state and has imide groups comprising reacting

(I) a polyisocyanate,

(II) a polycarboxylic acid having at least one acid anhydride group, and if necessary

(III) a polycarboxylic acid other than the above-mentioned (II) in the presence of a liquid medium containing at least one non-aqueous organic liquid (A) in which the resulting particulate polymer having imide groups is substantially insoluble, and thereby obtaining a particulate polymer having imide groups dispersed in the non-aqueous organic liquid (A).

4,427,823

CURED OR UNCURED FILLED COATING COMPOSITION OF POLYFUNCTIONAL ACRYLIC-TYPE ACID ESTER AND UTILIZATION THEREOF

Hajime Inagaki, Obtake, and Hiroshi Wakumoto, Iwakuni, both of Japan, assignors to Mitsui Petrochemical Industries Ltd., Tokyo, Japan

Filed Oct. 27, 1981, Ser. No. 315,292

Claims priority, application Japan, Oct. 28, 1980, 55-150130

Int. Cl.³ C09D 3/80; C08K 3/34, 3/36

U.S. Cl. 524—833 11 Claims

1. In an uncured filled coating composition comprising (a) a polyfunctional acrylic carboxylic acid ester monomer or its prepolymer, (b) a polymerization initiator capable of curing said monomer or prepolymer (a), and (c) an inorganic solid filler; the improvement wherein said composition consists essentially of

(A) 100 parts by weight of said polyfunctional acrylic carboxylic acid ester monomer or its prepolymer (a), said polyfunctional monomer or prepolymer (a) consisting essentially of a difunctional acrylic carboxylic acid ester monomer or its prepolymer having a molecular weight of about 160 to about 400, and 0 to 20 parts by weight, per 100 parts by weight of said monomer or prepolymer, of a monofunctional monomer copolymerizable with said monomer or prepolymer,

(B) 0.001 to 20 parts by weight of said polymerization initiator (b) capable of curing said monomer or prepolymer (A), and

(C) 5 to 250 parts by weight of said inorganic solid filler (c), said filler (c) having a refractive index of 1.40 to 1.60 and an average first-order particle diameter of at least 1 mμ but less than 1μ.

4,427,824

METHOD FOR DISPERSING PIGMENTS

Yasushi Kato, and Hisao Furukawa, both of Kobe, Japan, assignors to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan

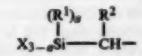
Filed Nov. 2, 1981, Ser. No. 316,787

Claims priority, application Japan, Nov. 8, 1980, 55-157289

Int. Cl.³ C08L 83/02

U.S. Cl. 524—858 5 Claims

1. A method of dispersing color fillers, comprising the steps of adding hydrolyzable organic silicon containing ester compound and/or trialkyl orthoformate to a silyl group containing compound prior to or concurrently with dispersing of said color fillers in said silyl group containing compound, wherein said hydrolyzable organic silicon compound and/or trialkyl orthoformate is used in an amount of between 5 to 0.01 parts by weight per one part by weight of said color fillers, and wherein said silyl group containing compound is a vinyl polymer which contains in its molecule at least one silyl group of the formula:



wherein R^1 and R^2 are each a monovalent hydrocarbon group selected from an alkyl group, an aryl group and an aralkyl group each having 1 to 10 carbon atoms, X is a group selected from alkoxy, hydroxyl, acryloxy, aminoxy, phenoxy, thioalkoxy, ketoxymato, alkenyloxyl, and amino groups and a is an integer of 0, 1 or 2.

4,427,825

BLENDS OF POLYAMIDE AND ETHYLENE VINYL ALCOHOL COPOLYMERS

Alfieri Degrassi, Pottsville, Pa.; William Sacks, Gillette, N.J.; John P. Sibilia, Livingston, N.J.; Abraham M. Kotliar, Westfield, N.J., and Charles D. Mason, Chatham Township, Morris County, N.J., assignors to Allied Corporation, Morris Township, Morris County, N.J.

Filed Nov. 9, 1981, Ser. No. 319,165

Int. Cl.³ C08L 29/02; C08F 16/06

U.S. Cl. 525—56 21 Claims

1. A heterogeneous melt blended composition consisting essentially of: a polyamide; and from 1 to 65% by weight of an ethylene vinyl alcohol copolymer having 15 to 65 mol percent ethylene, in the absence of plasticizer, wherein there are regions of ethylene vinyl alcohol copolymer having an average diameter of less than 500 angstroms in the polyamide, said composition having been processed at a temperature of from about 225° C. to 252° C. and being substantially free from crosslinking.

4,427,826

PROCESS FOR THE CONTINUOUS PREPARATION OF RUBBER-MODIFIED POLYMERS OF VINYLAROMATICS

Adolf Echte, Ludwigshafen; Hermann Gausepohl, Mutterstadt; Hermann P. Hofmann, Frankenthal, and Hans Mittnacht, Weinheim, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Filed Jun. 15, 1981, Ser. No. 273,689

Claims priority, application Fed. Rep. of Germany, Jun. 25, 1980, 3023721

Int. Cl.³ C08F 279/02

U.S. Cl. 525—53 2 Claims

1. A process for the continuous preparation of a rubber-modified polymer of a vinylaromatic, wherein a mixture which contains one or more monomeric aromatic vinyl compounds and from 3 to 16% by weight, based on monomers, of one or more elastomeric polymers consisting principally of polymerized 1,3-diene units, with or without a solvent, is polymerized, in the absence of a free radical initiator but in the presence of a mercaptan as a chain transfer agent, at from 80° to 180° C.,

(a) in a first process stage, with stirring, up to a maximum conversion U_{max}, based on monomer or monomers, given by the equation

$$U_{max} = K - 1$$

where K is the amount of rubber in % by weight, based on monomer or monomers,

(b) is then polymerized further, in a second process stage, with stirring, to a conversion of from about 20 to about 50% by weight, and

(c) is then polymerized further, in one or more additional process stages, after which the polymer is treated in a devolatilization zone to remove vinylaromatic monomers and solvents, if any, and these constituents are recycled to the process, wherein the chain transfer agent is introduced after the second process stage (b), in an amount of from 0.01 to 0.2% by weight, based on vinyl-aromatic monomer, and the polymerization in process stage or stages (c) is taken to a monomer conversion of less than 85% by weight.

4,427,827

SYNTHESIS OF HORMONE FRAGMENTS

David Stevenson, Scarsdale, N.Y., assignor to USV Pharmaceutical Corporation, Tarrytown, N.Y.

Filed Oct. 20, 1982, Ser. No. 435,581

Int. Cl.³ C07C 103/52; C08L 89/00

U.S. Cl. 525—54.11 14 Claims

1. In the synthesis of a resin peptide of the formula R—CH$_2$—O—Z, from an intermediate resin peptide of the formula R—CH$_2$—O—Y—X wherein

R is an insoluble polystyrene resin;

Y is a terminal amino acid residue selected from the group consisting of Phe, Gly, Leu and Ala;

X is a protecting group in the α-amino position of Y; and

Z is either

a fragment (n-m) of human parathyroid hormone or an analog thereof in which Y is Phe and m is 34; Y is Gly and m is 12; or Y is Leu and m is 7, 11, 15, 24, or 28; and n is an integer from 1 to (m minus 1); or

a fragment (n-m) of human calcitonin or an analog thereof in which Y is Phe and m is 5, 6, or 11; Y is Gly and m is 2, 10, 28, or 30; Y is Leu and m is 4 or 9; or Y is Ala and m is 26 or 31; and n is an integer from 1 to (m minus 1);

wherein the residue Y is deprotected and neutralized and in succession each of the other amino acids whose residues comprise the fragment Z, each having a protecting group in the α-amino position, is coupled to the next preceding residue on the resin peptide and then deprotected and neutralized, the improvement comprising

(a) deprotecting the residue Y with trifluoroacetic acid, and

(b) deprotecting the other residues with hydrogen chloride dissolved in a solvent selected from the group consisting of dioxane and ethers containing from 4 to 6 carbon atoms.

4,427,828

IMPACT RESISTANT POLYMERIC COMPOSITIONS CONTAINING POLYAMIDES, MALEIC ANHYDRIDE ADDUCTS OF HYDROGENATED POLYMERS AND GRAFT COPOLYMERS THEREOF

William L. Hergenrother, Akron, Ohio; Mark G. Matlock, Decatur, Ill., and Richard J. Ambrose, Erie, Pa., assignors to The Firestone Tire & Rubber Company, Akron, Ohio

Continuation-in-part of Ser. No. 298,424, Sep. 1, 1981, abandoned, which is a continuation of Ser. No. 115,635, Jan. 28, 1980, abandoned, which is a continuation of Ser. No. 31,577, Apr. 19, 1979, abandoned. This application Aug. 20, 1982, Ser. No. 410,094

Int. Cl.³ C08L 77/00

U.S. Cl. 525—66 12 Claims

1. Impact resistanct polymeric compositions comprising:

(a) from 70 to 85 percent by weight of a polyamide having a number average molecular weight of at least 15,000; and

(b) from 15 to 30 percent by weight of a maleic anhydride adduct of a hydrogenated polymer of a conjugated diene or hydrogenated copolymer of a conjugated diene and a vinyl aromatic hydrocarbon, said hydrogenated polymer or copolymer having a residual unsaturation content of from about 0.5 to about 20% of its original unsaturation content prior to hydrogenation, wherein from 5 to 40 percent by weight of components (a) and (b) are present in the form of a graft copolymer containing at least 20 percent of polyamide.

4,427,829

POLYCARBONATE RESIN COMPOSITION

Osamu Ohara, and Kazuo Kishimoto, both of Matsuyama, Japan, assignors to Teijin Chemicals, Ltd., Tokyo, Japan

Filed Mar. 12, 1982, Ser. No. 357,597

Claims priority, application Japan, Mar. 19, 1981, 56-38730

Int. Cl.³ C08L 69/00, 23/20

U.S. Cl. 525—67 10 Claims

1. A polycarbonate resin composition comprising as main components

(A) 100 parts by weight of a polycarbonate resin derived from not less than 80 mole% of 2,2-bis(4-hydroxyphenyl)-propane,

(B) 0.3 to 10 parts by weight of a polymethylpentene resin,

(C) 0.3 to 10 parts by weight of an elastomeric acrylic graft copolymer containing not less than 3% by weight of butadiene as a comonomer and being free from ethylene as a trunk polymer and, grafted thereto, at least one grafting monomer selected from the group consisting of styrene, alkyl acrylates and alkyl methacrylates, and

(D) 0.3 to 10 parts by weight of an isobutylene copolymer rubber composed of a major amount of isobutylene and a minor amount of isoprene,

the total amount of (B), (C) and (D) being 2 to 20 parts by weight.

4,427,830

POLYETHERIMIDE-POLYPROPYLENE BLENDS

Harold F. Giles, Jr., Cheshire, and William R. Schlich, Pittsfield, both of Mass., assignors to General Electric Company, Pittsfield, Mass.

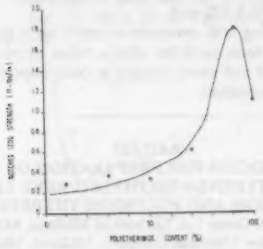
Filed Mar. 18, 1982, Ser. No. 359,506

Int. Cl.³ C08L 79/04, 79/08

U.S. Cl. 525—180 9 Claims

1. A composition comprising a blend of (a) an impact resist-

ance-enhancing amount of a polypropylene or copolymer of polypropylene and a single comonomer present in amounts



from about 1 to about 20% by weight based on the total weight of the copolymer thereof and (b) a polyetherimide.

4,427,831

RUBBER MATERIALS HAVING EXCELLENT GRIP ON ICE

Keiji Komuro, and Akio Ueda, both of Yokohama, Japan, assignors to Nippon Zeon Co. Ltd., Tokyo, Japan

Continuation of Ser. No. 102,848, Dec. 12, 1979, abandoned, which is a continuation of Ser. No. 899,693, Apr. 24, 1978, abandoned. This application Jul. 30, 1981, Ser. No. 288,548

Claims priority, application Japan, Apr. 27, 1977, 52-48870

Int. Cl.³ C08L 7/00, 9/00, 9/06

U.S. Cl. 525—211 **8 Claims**

1. A rubber material capable of being formed into rubber articles such as tires and shoe soles which have an excellent grip on ice surface and which do not damage ice-free surfaces in contact with the rubber articles, said material comprising a mixture of an ordinary rubber and a powder of norbornene polymer which hardens at service temperatures on ice and softens at higher temperatures and which does not lose its shape as a powder when heated during curing or shaping, wherein the ordinary rubber is a butadiene rubber, a styrene-butadiene rubber, an isoprene rubber, or a natural rubber.

4,427,832

THERMOPLASTIC RESIN COMPOSITIONS

Norio Yagi, Atsugi; Hisashi Chiba; Yutaka Mitsuda, both of Machida; Yasuaki Sakano, Ichihara, and Masaki Aikawa, Funabashi, all of Japan, assignors to Denki Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 17, 1981, Ser. No. 284,163

Int. Cl.³ C08F 212/06, 212/10

U.S. Cl. 525—238 **9 Claims**

1. A process for the preparation of copolymers by the emulsion polymerization of a monomer mixture comprising 65 to 80% by weight of α-methylstyrene, 15 to 30% by weight of a vinyl cyanide compound and 0 to 20% by weight of other vinyl compounds copolymerizable therewith in an aqueous medium, which comprises carrying out the polymerization in one stage of polymerization while initiating the polymerization in the presence of the whole amount of α-methylstyrene and a partial amount of the vinyl cyanide compound, adding the residual amount of the vinyl cyanide compound continuously or intermittently in the course of the polymerization from initial stage up to termination of the polymerization and maintaining a proportion of unreacted monomers present during substantially the entire time of the polymerization to be such that a molar ratio of the total of α-methylstyrene and the copolymerizable vinyl compound to the vinyl cyanide compound is within the range of 1.3 to 3.0.

8. A thermoplastic resin composition which comprises (A) 10~90% by weight of the copolymer obtained by the process of claim 1 and (B) 10~90% by weight of a polymer composition selected from the group consisting of an acrylonitrile/-butadiene/styrene polymer composition, an acrylonitrile/ethylene.propylene.diene rubber/styrene polymer composition, an acrylonitrile/chlorosulfonated polyethylene/styrene polymer composition, an acrylonitrile/acrylic rubber/styrene polymer composition and a vinyl chloride polymer composition, said (A) and (B) forming 100% by weight of said thermoplastic resin composition.

4,427,833

POLYETHYLENE EXTRUSION COATING COMPOSITIONS

Ray Edwards, Henderson, Tex., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Mar. 19, 1982, Ser. No. 359,977

Int. Cl.³ C08F 36/16

U.S. Cl. 525—240 **4 Claims**

1. An extrusion coating composition capable of providing a coating having a thickness of about 0.0254 mm or less at coating speeds of at least 4 meters per second consisting essentially of a polyethylene component comprising low density polyethylene having a density of 0.916 to 0.926, a melt index at 190° C. of 0.1 to 2.0, and a swell ratio of less than 1.50.

4,427,834

DISPERSANT-VI IMPROVER PRODUCT

Michael K. Martin, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed Dec. 21, 1981, Ser. No. 332,690

Int. Cl.³ C08F 297/04

U.S. Cl. 525—280 **13 Claims**

1. A process for preparing an oil-soluble, star-shaped product having the properties of both a viscosity index-improver and a dispersant, said process consisting essentially of:

(a) a solution polymerizing one or more monomers selected from the group consisting of conjugated diene and monoalkenyl arenes under polymerization conditions at a temperature between about −75° C. to +150° C. with an organomonolithium compound, therein forming living polymeric arms;

(b) contacting said living polymeric arms with a polyalkenyl aromatic coupling agent at a temperature between about 0° C. and about +150° C., therein forming a coupled polymer having a poly(polyalkenyl aromatic) nucleus and attached polymeric arms;

(c) contacting said coupled polymer with a nitrogen containing polar compound monomer therein attaching poly(nitrogen containing polar compound) arms to said nucleus; and

(d) contacting the resulting polymer with hydrogen and a hydrogenation catalyst under hydrogenation conditions, therein reducing by hydrogenation at least about 80% of the aliphatic unsaturation of the polymeric arms while reducing less than 20% of the aromatic unsaturation.

4,427,835

AGENTS FOR PREPARING CROSS-LINKED POLYMERS AND PAINT AND PLASTIC COMPOSITIONS CONTAINING THOSE AGENTS

Rodney D. Bush, Cincinnati, Ohio, and Medford D. Robbins, Whitewater Township, Franklin County, Ind., assignors to The Procter & Gamble Company, Cincinnati, Ohio

Filed Aug. 7, 1981, Ser. No. 290,918

Int. Cl.³ C08F 267/06

U.S. Cl. 525—293 **9 Claims**

1. An agent for preparing crosslinked polymers, comprising:

(a) a major portion of a polymer selected from polyacrylates having a molecular weight of from about 1,000 to about 10,000, this portion constituting the backbone of said agent; and

(b) a minor portion of mono- or disubstituted olefinic groups pendant from said backbone, with the olefinic substituents

on the groups being unpolymerized, said groups having polymerization rate constants between about 10×10^{-4} and 1000×10^{-4} mole^{-1} liter^{1} minute^{-1} at 70° C.

4,427,836

SEQUENTIAL HETEROPOLYMER DISPERSION AND A PARTICULATE MATERIAL OBTAINABLE THEREFROM, USEFUL IN COATING COMPOSITIONS AS A THICKENING AND/OR OPACIFYING AGENT

Alexander Kowalski, Glenside; Martin Vogel, Jenkintown, and Robert M. Blankenship, Lansdale, all of Pa., assignors to Rohm and Haas Company, Philadelphia, Pa.

Division of Ser. No. 158,759, Jun. 12, 1980, abandoned, which is a continuation-in-part of Ser. No. 52,280, Jun. 26, 1979, abandoned. This application Feb. 25, 1982, Ser. No. 352,396

Int. Cl.[3] **C08F** *265/02*

U.S. Cl. 525—301 **25 Claims**

1. A process for making an aqueous dispersion of water-insoluble core/sheath polymer particles comprising

(a) sequentially emulsion polymerizing at a temperature of from about 10° C. to about 100° C. in an aqueous medium containing a free radical initiator:

a core monomer system comprising one or more monoethyleneically unsaturated monomers having a group of the formula —HC=C<, at least one of which has a carboxylic acid group, the core monomer system comprising at least 5% of a carboxylic acid monomer based on the weight of the core monomer system, to thereby form dispersed core particles having an average diameter of from about 0.05 to 1 micron, and

(b) polymerizing in the presence of the core polymer dispersion resulting from (a) a sheath monomer system comprising at least one monoethylenically unsaturated monomer having no ionizable group to form a sheath polymer on the core particles, any monoethylenically unsaturated carboxylic acid in the sheath monomer mixture being present in an amount of no more than 10% by weight of the sheath monomers, the proportion of carboxylic acid in the sheath monomer mixture being less than ½ the proportion thereof in the core monomer mixture, said sheath being (i) permeable to an aqueous volatile base selected from ammonia and amines, (ii) having a T_f of greater than 50° C., and (iii) being non film-forming at 20° C.,

the resultant core-sheath particles having an average diameter before neutralization and swelling of from about 0.07 to 4.5 microns, the relative amounts of core-forming monomer(s) and sheath-forming monomer(s) being such that the ratio of the weight of the core to the weight of the total polymer in the resulting dispersed particles is from about 1:4 to 1:100, and

(c) neutralizing with ammonia or amine so as to swell said core and form particles which, when dried, contain a single void and cause opacity in compositions in which they are contained.

4,427,837

PROCESS FOR PREPARATION OF DIENE-STYRENE-α-METHYLSTYRENE BLOCK POLYMERS AND POLYMERS THEREFROM

Lu H. Tung, and Grace Y-s. Lo, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 248,623, Mar. 27, 1981, abandoned, which is a continuation-in-part of Ser. No. 176,884, Aug. 11, 1980, abandoned. This application Aug. 28, 1981, Ser. No. 297,371

Int. Cl.[3] **C08F** *297/04*

U.S. Cl. 525—314 **30 Claims**

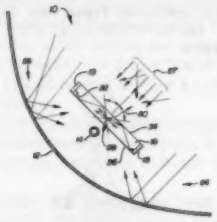
1. A process for the preparation of block polymers by the sequential polymerization of at least one conjugated diene monomer to form a diene polymer block and copolymerization of a vinyl aromatic monomer and an isopropenyl aromatic monomer to form a vinyl aromatic monomer-isopropenyl aromatic monomer polymer block, the polymerization being conducted in a solvent, the solvent comprising the isopropenyl aromatic monomer, the isopropenyl aromatic monomer being present in an excess of at least 2 moles per liter of reaction mixture, polymerization being initiated by a lithium based polymerization initiator, maintaining the monomeric components at a temperature between about 20° centigrade and about 160° centigrade during the formation of the vinyl aromatic monomer-isopropenyl aromatic monomer polymer block to thereby provide a diene-vinyl aromatic monomer-isopropenyl aromatic monomer block copolymer wherein the ratio of vinyl aromatic monomer to isopropenyl aromatic monomer is from about 50 to 1 to about 1 to 50, with the further limitation that the molecular weight of the block copolymer as determined by gel permeation chromatography is from about 5,000 to 800,000 molecular weight units.

4,427,838

DIRECT AND DIFFUSED SOLAR RADIATION COLLECTOR

Arnold J. Goldman, 55 Bar Kochva St., Jerusalem, Israel

Filed Jun. 9, 1981, Ser. No. 271,959
Int. Cl.³ H01L 31/04; F24J 3/02
U.S. Cl. 136—248 13 Claims



1. A solar energy collecting apparatus for collecting direct radiant energy having parallel paths as well as diffused radiant energy from the sun, said apparatus comprising:

a first absorption means for absorbing concentrated direct radiant energy and transforming the collected direct radiant energy into another form;

a second absorption means, located adjacent said first absorption means, for absorbing diffused radiant energy and transforming the collected diffused radiant energy into another form, said second absorption means comprising a fluorescent panel and an array of solar cells associated with and circumferentially surrounding said panel such that radiant energy entering the panel causes molecules within the panel to fluoresce with a substantial portion of emitted fluorescent light being internally reflected to the solar cells for conversion to electricity, said panel also being oriented for directly absorbing direct radiant energy from the sun for conversion to electricity; and

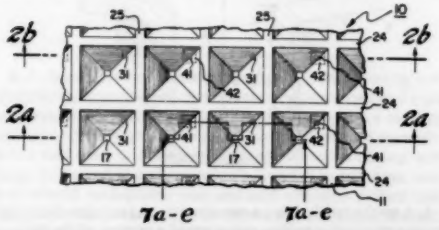
reflector means for reflectively concentrating direct radiant energy onto said first absorption means at a concentration ratio of at least twenty suns to one and for reflecting diffused radiant energy onto said second absorption means, and wherein said reflector means comprises a trough-shaped reflective wall having a substantially parabolic cross-section which defines a focus, said first absorption means being positioned at said focus, and said and second absorption means positioned adjacent said focus.

4,427,839

FACETED LOW ABSORPTANCE SOLAR CELL

Robert N. Hall, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Nov. 9, 1981, Ser. No. 319,824
Int. Cl.³ H01L 31/06
U.S. Cl. 136—255 12 Claims



1. A photovoltaic device comprising: a body of cubic symmetry monocrystalline semiconductor material of one conductivity type having a upper and lower opposite parallel major surfaces, each parallel to a (100) crystallographic plane of said body;

a plurality of recesses arranged in equally spaced rows and columns in said body, each of said recesses being in the form of a quadrangular pyramid with the base of the pyramid coplanar with said upper major surface and extending a uniform distance into said body, each of the sides of the recesses being parallel to a (111) plane of said body of monocrystalline semiconductor material, the bases of adjacent pyramids being separated by a distance s defined by the relation $s=3t/2$ (cot $\theta-b/4$), wherein t is the separation of said upper and lower parallel major surfaces, b is the length of a side of the pyramind base, and θ is the propagation angle of light that has entered the semicondutor through the (111) surfaces of the apertures;

a first thin region of opposite conductivity type in said body along said upper major surface of said body;

a second thin region of opposite conductivity type in said body along said lower major surface of said body, said second thin region of opposite conductivity type having openings therein exposing portions of said body of said one conductivity type;

a plurality of third thin regions of opposite conductivity type, each in said body along the sides of said recesses, each of said third thin regions contacting said first and second thin regions;

a dielectric layer disposed on said lower major surface of said body, said dielectric layer having a first plurality of openings under said recesses and exposing said portions of said body of said one conductivity type, said dielectric layer having a second plurality of openings under said recesses and exposing said second thin region of opposite conductivity type;

a first means positioned on said dielectric layer for making conductive connections to said exposed portions of said body; and

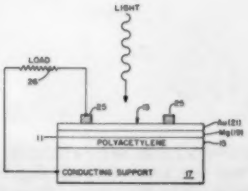
a second means positioned on said dielectric layer for making conductive connections to said second thin region of opposite conductivity type.

4,427,840

PLASTIC SCHOTTKY BARRIER SOLAR CELLS

James R. Waldrop, and Marshall J. Cohen, both of Thousand Oaks, Calif., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Dec. 30, 1981, Ser. No. 335,994
Int. Cl.³ H01L 31/06
U.S. Cl. 136—255 6 Claims



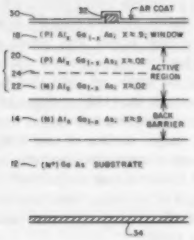
1. A Schottky barrier junction photovoltaic cell comprising an organic semiconductor active material in rectifying contact with a conductive electrode, wherein said organic material is comprised of undoped polyacetylene having a thickness of the order of a depletion depth; and wherein said conductive electrode is comprised of a thin layer of magnesium, said magnesium layer forming a Schottky barrier junction with said polyacetylene, and a thin layer of gold on said magnesium layer.

4,427,841

BACK BARRIER HETEROFACE ALGAAS SOLAR CELL

W. Patrick Rahilly, Spring Valley, Ohio, assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Jun. 29, 1982, Ser. No. 393,268
Int. Cl.³ H01L 31/06, 31/18
U.S. Cl. 136—255 4 Claims



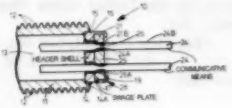
1. A solar cell comprising an active region of aluminum gallium arsenide between window and back barrier layers of larger but approximately equal bandgap of aluminum gallium arsenide, with the back barrier layer formed on a substrate of gallium arsenide, wherein the active region has a relatively low proportion of aluminum to gallium and is divided into a layer of one conductivity type and a layer of the opposite conductivity type which form a P-N junction, and wherein the back barrier layer has a relatively high proportion of aluminum to gallium and is sufficiently thick so as to prevent tunneling.

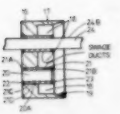
4,427,842

FEEDTHROUGH APPARATUS

Harry V. Anderson, Minneapolis, Minn., assignor to Rosemount Inc., Eden Prairie, Minn.

Filed Mar. 12, 1982, Ser. No. 357,463
Int. Cl.³ H02G 3/22, 15/013
U.S. Cl. 174—77 R 12 Claims





1. A feedthrough apparatus for a bulkhead comprising:
a header shell with header shell openings therethrough;
swage duct means having a portion thereof mounted in and opening through the header shell;
communicative means for transferring signals through the bulkhead disposed in the swage duct means; and
swage plate means having swage plate openings therethrough for receiving the swage duct means therein and being of size to swage the swage duct means onto the communicative means when the swage duct means is in position within the swage plate means.

4,427,843

ROD INSULATOR WITH ELASTIC OVERCOATS AND CONDUCTING PATHS STRADDLING JOINT PORTIONS OF ADJACENT OVERCOATS

Takeshi Ishihara, Toyoake; Michio Ishiwari, Kasugai, and Shigeo Ishino, Aichi, all of Japan, assignors to NGK Insulators Ltd., Nagoya, Japan

Filed Nov. 19, 1981, Ser. No. 322,754
Claims priority, application Japan, Nov. 20, 1980, 55-162705
Int. Cl.³ H01B 17/46, 17/12
U.S. Cl. 174—140 S 17 Claims

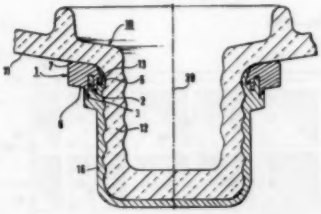
1. A synthetic resin insulator, comprising a fiber-reinforced plastic rod, holding metal fittings which hold both ends of the fiber-reinforced plastic rod, a plural number of overcoats which consist of an elastic insulating material and cover the total surface of the fiber-reinforced plastic rod located between the holding metal fittings, and conducting paths formed straddling the joint portion of adjacent overcoats in order that leakage current, which flows on the surface of the insulator when the insulator is wetted, flows through the conducting path and does not flow through the joint portion of the overcoats.

4,427,844

METAL-CAPPED ELECTRICAL INSULATOR AND METHOD OF MAKING SAME

Charles Saby; Serge Jeannin, and Jean-Paul Perrier, all of Saint-Yorre, France, assignors to Societe Anonyme dite: CERAVER, Paris, France

Filed Jan. 18, 1982, Ser. No. 340,104
Claims priority, application France, Jan. 30, 1981, 81 01808
Int. Cl.³ H01B 17/38, 19/00; B22D 19/00
U.S. Cl. 174—188 5 Claims



1. A method of forming a metal cap on an insulator dielectric by directly casting molten metal round a portion of the dielectric to embed the dielectric therein, said method comprising the steps of: forming a metal washer having an axially directed open groove; placing said metal washer on an insulator in such

a position as to form a boundary between a portion of the insulator which is to be embedded and a portion which is not to be embedded, said washer being placed against a metal-casting mold with the axially directed groove of the washer open towards the side of the boundary which will receive the molten metal; applying pressure to said washer so as to deform it, firstly so that its surfaces which are in contact with the insulator match the profile of the insulator and secondly so that the side walls of said circular groove are deflected from being axial to provide an undercut in the washer, and casting molten metal into the metal-casting mold over the portion of the insulator to be embedded up to said washer to form a metal cap on said portion to be embedded.

3. A metal-capped electrical insulator comprising:

an insulator dielectric having a head portion and an annular shouldered portion extending outward from the head portion;

a cast metal washer surrounding the head portion of the insulator dielectric, the washer having an annular surface mating with the annular surface of the shouldered portion of the insulator and an axially extending annular groove opening away from the shouldered portion toward the head portion of insulator, the annular groove having straight sides in cross section, one of which is inclined relative to the axis of the washer so as to be undercut; and

a cast metal cap embedding the head portion of the insulator dielectric, the metal of the cap extending into the undercut annular groove to interlock the cap with the washer.

4,427,845

DYNAMIC MICROPHONE

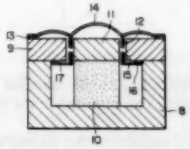
Satoshi Yoshida, Tokorozawa, Japan, assignor to Pioneer Electronic Corporation, Tokyo, Japan

Filed Jul. 15, 1981, Ser. No. 283,321

Claims priority, application Japan, Jul. 19, 1980, 55-102296[U]

Int. Cl.³ H04R 3/04

U.S. Cl. 381—94 **11 Claims**



1. A dynamic microphone comprising: a case; a moving coil type microphone unit sensitive to sound, said moving coil type microphone unit being positioned in said case; and a moving coil type vibration pickup unit sensitive to vibrations transmitted to said case, said moving coil type vibration pickup unit being positioned in and operatively coupled to said case, outputs of said microphone unit and said vibration pickup unit being coupled to each other in opposite phase to one another so that noise components corresponding to said vibrations transmitted to said case are cancelled, and said microphone unit and said vibration pickup unit having a common magnetic circuit.

4,427,846

MOVING COIL LOUDSPEAKERS

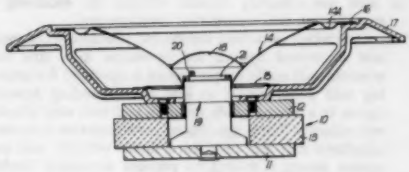
Gareth P. Millward, Alwoodley, England, assignor to Wharfedale Limited, Bradford, United Kingdom

Filed Feb. 20, 1981, Ser. No. 236,565

Claims priority, application United Kingdom, Feb. 21, 1980, 8005946

Int. Cl.³ H04R 7/12, 9/02, 9/06

U.S. Cl. 179—115.5 VC **10 Claims**



1. In a moving coil loudspeaker, the improvement comprising a cone made of a material comprised of a homopolymeric polypropylene incorporating from 20% to 40% by weight mineral filler, said cone material having a mechanical Q in the range 7 to 15, a Young's modulus in the range 28×10^5 to 57×10^5 KN/M^2, and density in the range of 1.05 to 1.45 gm/cc, a voice coil assembly including an apertured aluminum former carrying lapping paper at a joint with the cone, wherein the lapping paper is not overlapped in the direction of the periphery of the former, and wherein a minimal gap not exceeding 2 mm is left between adjacent ends of the lapping paper, said gap being slanted to the axis of the former and disposed on the opposite side from a gap between adjacent edges of the former material.

4,427,847

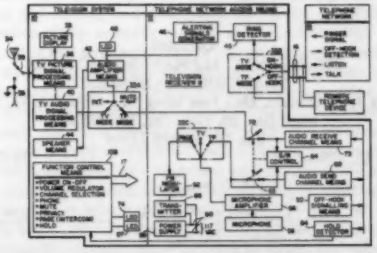
TELEVISION/TELEPHONE SYSTEM WITH ANNUNCIATOR AND INTERCOM FEATURE

Judson A. Hofmann, Schaumburg, and Paul A. Snopko, Chicago, both of Ill., assignors to Zenith Radio Corporation, Glenview, Ill.

Filed Aug. 10, 1981, Ser. No. 291,655

Int. Cl.³ H04M 11/08

U.S. Cl. 179—2 TV **24 Claims**



1. A combined television, telephone and annuciator system housed within a unitary television cabinet comprising:

video signal processing and display means responsive to a received television signal for producing a video display image corresponding to the video component thereof;

audio signal processing means responsive to a received television signal for producing an audio signal corresponding to the audio component thereof;

audio output means comprising audio amplifier means and speaker means, said audio output means being operable for converting said audio signal to a corresponding acoustical signal;

telephone network access means operable for providing a two-way telephone conversation link between a user of said combined system and a telephone caller, said two-way telephone link comprising a listen channel including said audio output means and a talk channel including microphone means disposed within said cabinet in close proximity with said speaker means;

annunciator means operable in cooperation with said microphone means for transmitting a message voiced by the user of said system to a remote location, said transmitted message being excluded from said audio output means;

at least one remotely located receiver for receiving and reproducing said transmitted message; and

user-controlled switching means for selectively controlling said combined system for operation in a first mode wherein said audio output means is operated for converting said audio signal to said corresponding acoustical signal, in a second mode wherein said two-way telephone conversation link is established in response to an incoming telephone call and in a third mode wherein said audio output means is muted to prevent acoustical feedback from said speaker means to said microphone means while said annunciator means is operated for announcing said incoming telephone call to a remotely located party by transmitting a selected message voiced by the user of said combined system for reproduction by said remotely located receiver.

7. The method of operating a home communications system housed within a unitary cabinet comprising:

operating the video and audio signal processing circuits of a television receiver for viewing and listening to the video and audio components of a received television signal;

providing an alerting signal through the speaker of the audio circuit of said television receiver for indicating an incoming telephone call;

establishing a two-way telephone conversation link between the viewer of said television receiver and the telephone caller, said two-way telephone link comprising a listen channel operating through the speaker of said television receiver audio circuit and a talk channel including microphone means disposed within said cabinet in close proximity with said speaker; and

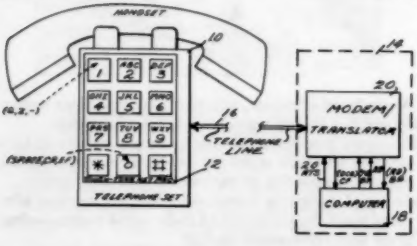
using said microphone means to transmit a message through the home power grid system and which is excluded from the television receiver audio circuit for announcing the telephone call to a location remote from said television receiver while muting the television receiver audio circuit to prevent acoustical feedback from said speaker to said microphone means.

4,427,848

TELEPHONIC ALPHANUMERIC DATA TRANSMISSION SYSTEM

Peter J. Tsakanikas, 1911 Fort Myer Dr., Arlington, Va. 22209

Filed Dec. 29, 1981, Ser. No. 335,516
Int. Cl.³ H04M *11/06*
U.S. Cl. 179—2 DP **52 Claims**



1. A system of the type responsive to signals from a telephone set, said signals including a plurality of distinct interconnection supervisory signals, said system including translation means for converting said supervisory signals into a computer compatible code, and means for transmitting respective computer compatible codes to a computer device, said translation means comprising:

decoder means, responsive to said signals from said telephone set, for generating a first digital code word indicative of the particular supervisory signal present in said signal from said telephone set;

a plurality of translator means, each translator means responsive to said telephone signals and for generating a respective second code word indicative of different predetermined sequences of said supervisory signals;

memory means, responsive to address signals applied thereto and including at least one individually addressable location corresponding to each symbol in said computer compatible code containing indicia of the corresponding code symbol, for generating an output signal indicative of the contents of an addressed location therein in accordance with said address signals;

means for applying said first code word to said memory means as a portion of said address signal;

selector means, responsive to control signals applied thereto, for selecting one of said plurality of translator means, and applying the second code word generated by said selected translator means to said memory means as another portion of said address signal; and

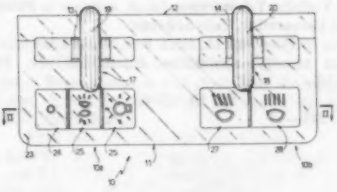
means, responsive to said memory means output signals and a strobe control signal applied thereto, for selectively transmitting indicia of said symbol code to said computer.

4,427,849

DEVICE FOR CONTROLLING THE ILLUMINATION OF MOTOR VEHICLE LIGHTS

Franco Recluta, Turin, Italy, assignor to Fiat Auto S.p.A., Turin, Italy

Filed Mar. 22, 1982, Ser. No. 360,325
Claims priority, application Italy, Apr. 8, 1981, 53118/81[U]
Int. Cl.³ H01H *19/00*
U.S. Cl. 200—6 R **14 Claims**



1. A device for controlling the illumination of the lights of a motor vehicle adapted to be mounted in the dashboard of said vehicle, comprising:

(a) first and second support bodies having internal surfaces, said support bodies being connected together with said surfaces facing each other, said facing surfaces defining a chamber;

(b) a plurality of tracks disposed in a three dimensional configuration, said tracks comprising conductive material and mounted between said first and second support bodies facing, at least in part, toward said chamber and fixed to a correspondingly configured seat formed in said second support body by means of studs which project from said second support body and over peripheral parts of each of said tracks;

(c) a first lever pivotably mounted between said first and second bodies, and having a first arm which projects out from said support bodies and which can be manually operated and a second arm moveable within said chamber;

(d) resilient means interposed between said lever and one of said support bodies and serving to establish a plurality of angular working positions of said lever with respect to said first and second support bodies; and

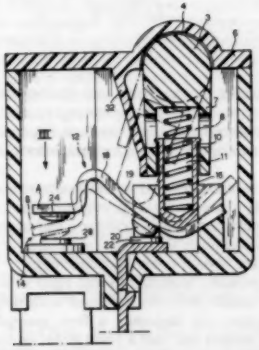
(e) a first electric contact element supported by said second arm of said first lever and operable to connect at least two of said tracks.

4,427,850

MONOSTABLE SWITCH DEVICE FOR CONTROLLING THE REAR WINDOW WASHER/WIPER OF AN AUTOMOBILE

Felice Fassio, Asti, Italy, assignor to Fiat Auto S.p.A., Turin, Italy

Filed May 13, 1982, Ser. No. 377,767
Claims priority, application Italy, May 29, 1981, 67719 A/81
Int. Cl.³ H01H *21/22*
U.S. Cl. 200—6 R 1 Claim



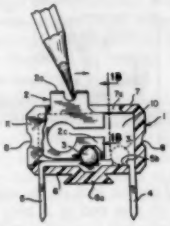
1. A switch device for controlling a rear window washer/-wiper of an automobile comprising a switch unit body adapted to be mounted on the steering column in said automobile, an electrical switch housed within said switch unit body and including a moveable part displaceable between a first position corresponding to an open condition of said switch and a second position corresponding to a closed position of said switch, a control arm rotatably mounted in said body for rotation about the longitudinal axis of the arm between first and second predetermined angular positions, switch operating means mechanically interconnecting said control arm and said moveable part of said switch such that manual rotation of said arm from its first position to said second position causes displacement of said moveable part from its first position to its second position to close said switch and biasing means comprised of a resilient tongue of integral one piece construction with said body and disposed in operative engagement with said switch operating means for biasing said switch operating means and said control arm to said first positions respectively upon release of said control arm.

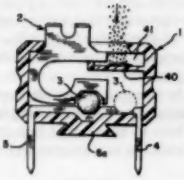
4,427,851

GANGED ELECTRICAL SWITCHES FOR INTEGRATED CIRCUIT APPLICATIONS

Pierre P. Schwab, Port St. Lucy, Fla., assignor to B/K Patent Development Company, Inc., Los Angeles, Calif.

Continuation-in-part of Ser. No. 199,354, Oct. 21, 1980, Pat. No. 4,356,361. This application Jun. 4, 1982, Ser. No. 384,938
The portion of the term of this patent subsequent to Oct. 26, 1999, has been disclaimed.
Int. Cl.³ H01H *15/00*
U.S. Cl. 200—16 D 8 Claims





1. A ganged electrical switch comprising:

an electrically insulating, substantially rectangular housing having a plurality of electrically non-conducting walls, including a base wall, a top wall having a multitude of apertures therein, and two end walls;

a multitude of pairs of elongated electrically conducting terminals secured to and extending through the base wall of the housing and protruding outwardly therefrom in substantially mutually parallel spaced relationship, each pair of said terminals having a portion located inwardly of the housing in a non-contacting, spaced relationship to the inwardly located portion of the other terminal of that pair;

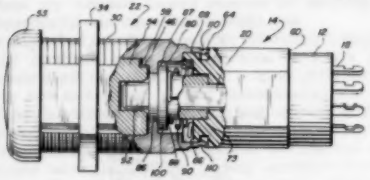
an electrically conducting contact bearing corresponding to each pair of terminals disposed within the housing and adapted to be movable between a first position in which the contact bearing is in contact with but one of the paired terminal portions located within the housing and a second position in which the contact bearing bridges the span between and is in simultaneous contact with both of the inwardly located paired terminal portions, said first and second positions corresponding respectively to "off" and "on" configuration of the electrical switch; and

a switch actuating member of electrically non-conducting material corresponding to each pair of terminals, said member being slidably disposed within the housing and engageable through an aperture in the top wall of the housing for actuating the switch, said member being adapted to resiliently bias the corresponding movable contact bearing in said first and second positions and permit the contact bearing to move in response to and in cooperation with the sliding movement of the member between the first and second positions.

4,427,852
ANTI-STATIC SWITCH LOCK AND METHOD FOR ASSEMBLY THEREOF

Stanley C. Wolniak, Broadview; Herbert Kincaid, Libertyville; Elbert M. Spencer, Wildwood, and Ronald L. Brown, Waukegan, all of Ill., assignors to The Eastern Company, Naugatuck, Conn.

Filed Aug. 25, 1982, Ser. No. 411,259
Int. Cl.³ H01H *9/28*
U.S. Cl. 200—44 **9 Claims**



1. An improved switch lock of the type having a terminal assembly secured to one end of a hub, a keylock assembly including a barrel attached to another end of the hub and a key operated, rotatable plug disposed in said barrel, said plug interconnected to said terminal assembly for operation thereof, the improvement comprising:

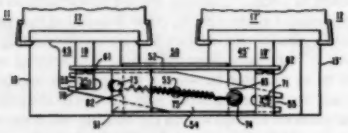
said another end of said hub has a cylindrical boss extending outward therefrom said boss extending coaxially from said hub another end and including a lip protruding radially outwardly therefrom to, in cooperation with said another end, form a groove;

said barrel has an integral receptacle to receive said boss and at least one inwardly extending dimple-like indentation to engage said boss to attach said hub thereto, said indentation being located in said groove to interconnect said hub and barrel.

4,427,853
CONVERTIBLE MOMENTARY/MAINTAINED ELECTRIC SWITCH

Stephen G. Layciak, Brighton Township, Beaver County; Robert J. Johnston, Patterson Heights, and Dominic Colista, Harmony Township, Beaver County, all of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Apr. 23, 1982, Ser. No. 371,387
Int. Cl.³ H01H *9/20*
U.S. Cl. 200—50 C **1 Claim**



1. An electric control switch, comprising:

(a) at least two pushbutton units each having a plurality of stationary and movable contacts;

(b) each pushbutton unit having movable actuating means for operating the plurality of stationary and movable contacts between opened and closed positions to control an electric circuit;

(c) an interlock means connected between the movable actuating means of each pushbutton unit for allowing the movable actuating means to be operated individually, but not simultaneously;

(d) the interlock means comprising an interlock lever movable about a pivot point and connected at each end to the movable actuating means of the pushbutton units whereby during operation of one movable actuating means to one operating position the interlock lever is disposed to cause operation of the other movable actuating means to an inverse operating position;

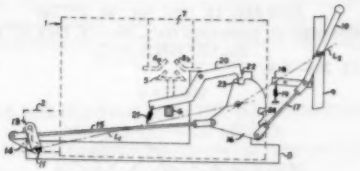
(e) the interlock lever having latching pins passing therethrough at opposite ends thereof and a biasing spring connected between the latching pins; and

(f) the interlock means being further comprised of support brackets for supporting and mounting the interlock lever between the two pushbutton units, the support brackets having projections thereon over which the latching pins must pass when the interlock lever moves between operating positions such that the biasing spring forces the latching pins against the projections to maintain the interlock lever and the movable actuating means connected thereto in their last selected operating position.

4,427,854
RACKING MECHANISM FOR MOTOR CONTROL CENTER

John D. Kleinecke; Samir F. Farag, and Thomas R. Little, all of Wichita Falls, Tex., assignors to Siemens-Allis, Inc., Atlanta, Ga.

Filed Apr. 28, 1982, Ser. No. 373,092
Int. Cl.³ H01H *9/20*
U.S. Cl. 200—50 AA **9 Claims**



1. In a controller for applying and disconnecting electric power to and from a load compromising an outer enclosure and a rigid structure receiving a carriage disposed within the enclosure said carriage including a circuit interrupting mechanism;

a cross shaft member pivoted in said structure and extending transversely therethrough for engaging the circuit interrupting mechanism-bearing carriage and urging said carriage back and forth within said structure;

an arm coupled to said cross shaft member;

a bellcrank pivotally mounted to said rigid structure;

an elongate handle pivotally mounted with respect to said rigid structure and including a first, manually-engaged end and a second end and a pivot point intermediate the ends thereof;

a first rod connected to said bellcrank at a coupling point and coupling said bellcrank to said arm; and

a second rod coupling said bellcrank to the second end of said handle.

4,427,855
PILE-GAP SENSOR, ESPECIALLY FOR DEEP-PILE CARPET

Johannes Freermann, Ochtrup, Fed. Rep. of Germany, assignor to Carl Schmale KG, Ochtrup, Fed. Rep. of Germany

Filed Mar. 16, 1982, Ser. No. 358,812
Claims priority, application Fed. Rep. of Germany, Mar. 28, 1981, 3112320
Int. Cl.³ B65H *25/14*; G01B *5/06*
U.S. Cl. 200—61.13 **11 Claims**

1. A pile gap detector, especially for a web displaced along a transport path in a transport direction, said detector comprising:

a support formed with a substantially planar reference surface having a dimension in said direction substantially in

excess of the dimension of said gap in said direction and adapted to ride upon the pile of said web;

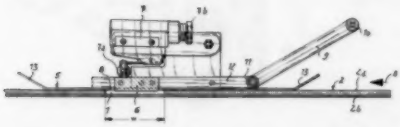
a sensor having a dimension in said direction equal at most to said dimension of said gap and movably mounted on said support so as to drop into said gap and thereby move relative to said surface in a direction generally transverse thereto;

means for floatingly mounting said support above said path whereby said surface rides freely on said web; and

a signal generator on said support operatively connected to said sensor for signaling relative movement of said sensor on said surface.

11. A pile gap detector, especially for a web displaced along a transport path in a transport direction, said detector comprising:

a support formed with a substantially planar reference surface having a dimension in said direction substantially in



excess of the dimension of said gap in said direction and adapted to ride upon the pile of said web;

a sensor having a dimension in said direction equal at most to said dimension of said gap and movably mounted on said support so as to drop into said gap and thereby move relative to said surface in a direction generally transverse thereto;

means for floatingly mounting said support above said path whereby said surface rides freely on said web; and

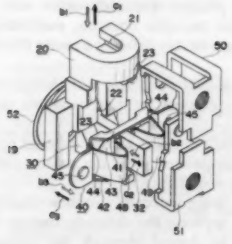
a signal generator on said support operatively connected to said sensor for signaling relative movement of said sensor on said surface, said surface being an elongated plate with its longitudinal dimension extending in said direction, the length of said plate being about five times greater than said dimension of said sensor, said surface being an elongated platform with a window, said sensor being movable in said window.

4,427,856

MECHANICAL SNAP SWITCH HAVING A MECHANISM FOR SEPARATING FUSED CONTACTS

Haruo Atsumi, Otsu, and Haruyuki Koizumi, Kyoto, both of Japan, assignors to Omron Tateisi Electronics Co., Kyoto, Japan

Filed Nov. 30, 1981, Ser. No. 325,666
Claims priority, application Japan, Dec. 9, 1980, 55-174431
Int. Cl.³ H01H *15/18*
U.S. Cl. 200—76 **7 Claims**



2. A mechanical switch comprising, in combination:

a push button member supported for movement between projected and depressed positions;

a movable member made of electrically insulating material and supported for movement between first and second positions in a direction perpendicular to the direction of movement of the push button member;

a biasing means for biasing the movable member to the first position;

means defined in said push button member and said movable member for causing the movable member to move from the first position towards the second position against the biasing means in response to the movement of the push button member from the projected position towards the depressed position;

a generally elongated contact carrier means supported for movement between operative and inoperative positions in a direction generally parallel to the direction of movement of the movable member, said carrier means being normally held in the operative position;

a pair of spaced terminal members defining the operative position for the carrier means, at least one of said terminal members having a stationary contact element;

a snap acting spring means interposed between the movable member and the carrier means such that, as the movable member being moved from the first position towards the second position in response to the movement of the push button member form the projected position towards the depressed position approaches the second position, the carrier means can be snapped to move from the operative position towards the inoperative position to open the circuit between terminal members; and

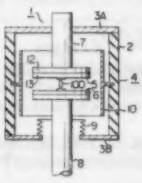
a sloped abutment defined in the push button member and engageable with a portion of the carrier means, when the push button member is moved to the depressed position, for forcibly separating the contact elements from the carrier means in the event that the contact elements have been fused to the carrier means.

4,427,857

VACUUM INTERRUPTER

Nobuo Abe, Tokaimura; Hiroyuki Sugawara, Hitachi; Yukio Kurosawa, Hitachi; Akira Wada, Hitachi, and Kiyoji Iwashita, Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Nov. 10, 1981, Ser. No. 319,985
Claims priority, application Japan, Nov. 17, 1980, 55-160715
Int. Cl.³ H01H *33/66*
U.S. Cl. 200—144 B **8 Claims**



1. A vacuum interrupter comprising a pair of separable arc electrodes disposed within a vacuum vessel in such a manner that main surfaces of said arc electrodes are opposed to each other, each of said arc electrodes are provided on a back side opposite to the main surface with a rod extending outwardly of said vacuum vessel, coil electrode means provided on at least one side of each of said arc electrodes for generating and applying to an arc magnetic fields which are in parallel with the arc generated on said arc electrode, and current blocking means selectively provided on each of said arc electrodes for suppressing eddy currents generated by said magnetic fields, wherein said vacuum interrupter further includes a reinforcement member of an electric conductivity higher than that of the main surface of said arc electrode, said reinforcement

member being provided on the back side of each of said electrodes except in areas of said current blocking means.

4,427,858

GROUNDING SWITCH

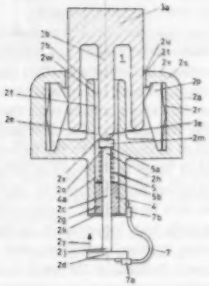
Werner Fehr, Effretikon; Claes Ohlin, Wetzikon, and Bruno Schabrun, Wurenlos, all of Switzerland, assignors to BBC Brown, Boveri & Company, Limited, Baden, Switzerland

Filed Nov. 3, 1981, Ser. No. 317,859

Claims priority, application Switzerland, Nov. 5, 1980, 8215/80

Int. Cl.³ H01H *33/12*

U.S. Cl. 200—146 R **4 Claims**



1. A grounding switch, comprising a fixed switch piece attached to an equipment part to be grounded, a switch piece displacable with respect to the fixed switch piece by a drive, the switch pieces partially forming a switch-piece overlap in their closed position, the switch pieces each have at least one main contact and at least one sparking contact surrounded at least partially by the respective main contact, the sparking contacts are spaced from the main contacts, one of the two sparking contacts is a bush and the other is a pin adapted to be received within the bush, the sparking contact which is a sparking bush includes a follow-up contact which is movable to a limited extent in a direction parallel to a displacement direction of the displaceable switch piece, and the follow-up contact being located within the interior of the sparking bush, a free end of said sparking bush extending beyond a free end of the follow-up contact in all positions of said follow-up contact.

4,427,859

HIGH VOLTAGE POWER SWITCH

Modesto-Manuel Cancio, Fislisbach, Switzerland, assignor to BBC Brown, Boveri and Company, Limited, Baden, Switzerland

Filed Jun. 18, 1981, Ser. No. 275,348

Claims priority, application European Pat. Off., Jun. 23, 1980, 80200596.7

Int. Cl.³ H01H *33/18*

U.S. Cl. 200—148 B **6 Claims**

1. A high-voltage power switch comprising:

a stationary contact;

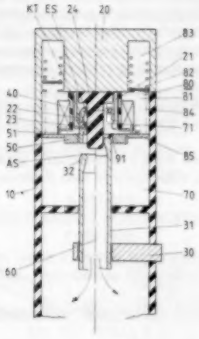
an axially displaceable contact having a nozzle through which compressed gas flows from a compression chamber to an expansion chamber during a current breaking process;

an annular contact axially displaced from said stationary contact;

a cylindrical coil surrounding said stationary contact and connected between said stationary contact and said annular contact;

a commutation chamber defined by said stationary contact and said annular contact;

an expansion chamber disposed outside of said stationary contact and having a volume sufficient to accomodate gas compressed in said commutation of an arc from said stationary contact to said annular contact; said expansion chamber having at least two chambers connected with each other by means of one-way valve; and



a radially disposed exhaust channel between said stationary contact and said annular contact for connecting said commutation chamber to said expansion chamber.

4,427,860

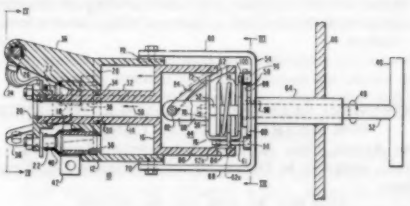
OIL-INSULATED SWITCH

Edgar R. Eley, Athens, Ga., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Feb. 19, 1982, Ser. No. 350,526

Int. Cl.³ H01H *33/88*

U.S. Cl. 200—150 G **5 Claims**



1. A circuit breaker comprising

(a) a cylindrical switch body having hollow, stationary contacts, a plunger disposed within said switch body which carries movable contacts, said switch body and plunger cooperatively defining a cavity filled with a liquid dielectric;

(b) means for axially operating said plunger between open and closed positions of said movable and stationary contacts;

(c) said stationary contacts having an axial opening therein which communicates with the cavity defined by said switch body and plunger;

(d) said cavity being reduced in volume when the plunger is operated to separate the contacts, causing the liquid dielectric to be forced through the hollow stationary contacts to aid arc extinction; and

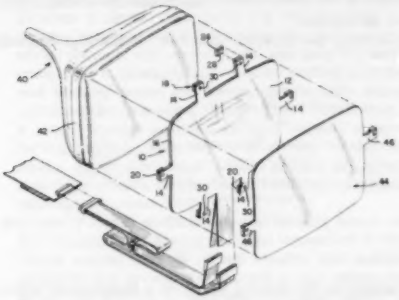
(e) said cavity being increased in volume when the plunger is operated to close the contacts, causing liquid dielectric to flow into the cavity through the hollow stationary contacts.

4,427,861

MEANS FOR MOUNTING MEMBRANE SWITCHES TO CATHODE RAY TUBES

Donald G. Stillie, Winston-Salem, N.C., assignor to AMP Incorporated, Harrisburg, Pa.

Filed Dec. 23, 1982, Ser. No. 452,586
Int. Cl.³ H01H 9/08
U.S. Cl. 200—159 B 14 Claims



1. A membrane switch having mounting means for mounting the switch to a cathode ray tube, the switch comprised of two layers of substantially transparent film having internal surfaces that are separated from each other by spacing means, the spacing means having openings therein constituting switch sites, the internal surfaces of each layer having conductors thereon, the conductors crossing and being normally spaced from each other at the switch sites, the mounting means being characterized in that:

a plurality of extensions protrude from the perimeter of at least one of the layers of film,

a patch of a coupled fastening assembly is attached to each extension,

the fastening assembly is comprised of two separable parts, the inner surfaces of which have a very large number of closely spaced hooking elements of the hook and loop type that engage with each other when the two parts are pressed together, whereby,

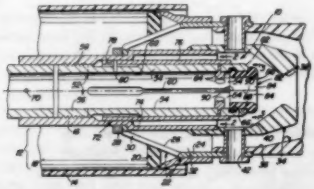
when the switch is aligned against the CRT, the extensions wrap around the perimeter of the CRT enabling the outer surfaces of the coupled fastening assemblies to be attached to one or more sides of the CRT.

4,427,862

CONTACT ASSEMBLY FOR A HIGH-VOLTAGE CIRCUIT INTERRUPTER

Chester H. Lin, Skokie, Ill., assignor to S&C Electric Company, Chicago, Ill.

Filed Nov. 8, 1982, Ser. No. 439,688
Int. Cl.³ H01H 9/38
U.S. Cl. 200—252 20 Claims



1. An improved female contact for a circuit interrupter which also includes a male contact; the male contact comprising an elongated conductive rod having a refractory free end which may be telescoped into and out of a male-contact-receiving cavity defined by the female contact when the contacts are relatively moved along coincident longitudinal axes; the female contact including an array of a plurality of parallel, elongated flexible fingers having free ends, the fingers and their free ends defining the cavity, the fingers being spring-biased toward the axes; wherein the improvement comprises:

at least two refractory members located in the vicinity of the free ends of the fingers and defining therebetween a male-contact-engageable, variable size passageway which is continuous with the cavity; the members not being attached to, being free floating laterally of the axes relative to, and being independently movable laterally of the axes with respect to, the fingers; an exterior surface of each member laterally remote from the passageway being engageable by the free end of a least one respective finger;

a pair of lateral stop surfaces on each member, each stop surface on one member facing a respective stop surface on an adjustment member, the facing stop surfaces abutting, when the male contact is out of the cavity and the passageway, due to the engagement of the members by the fingers, such abutment setting the extent of maximum movement of the members toward the axes;

holding means for preventing movement of the members along the axes while permitting the members to move laterally of the axes independently of and freely floating with respect to the fingers; and

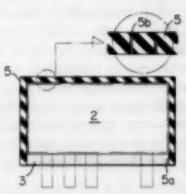
a male-contact-engageable conductive contact site on each finger remote from the free end thereof and extending toward the axes within the cavity, the diametric size of the cavity between the sites being smaller than the diametric size of the passageway when the male contact is out of the cavity and the passageway and the facing stop surfaces abut, the diameteric size of the cavity between the sites being equal to or smaller than the diametric size of the passageway when the male contact is in the cavity and engages the sites.

4,427,863

SMALL-SIZED RELAY AND METHOD FOR FABRICATING THE SAME

Teizo Fujita, Ibaraki, Japan, assignor to Izumi Denki Corporation, Osaka, Japan

Filed Mar. 22, 1982, Ser. No. 360,869
Int. Cl.³ H01H 9/04
U.S. Cl. 200—306 2 Claims



2. A small-sized relay comprising:

a relay mechanism;

a cover of an electrical insulator having an opening and covering said relay mechanism;

a plurality of holes of very small diameter formed in said cover, said holes being sized to permit flow of gaseous state molecules therethrough and to stop the flow of dust particles and liquid state molecules therethrough, said holes being provided at a major surface of said cover; and

means for subsequently hermetically sealing only the opening of said cover with said relay mechanism except for the portion including said previously formed holes of very small diameter, whereby said impermeable cover is pro-

vided with previously formed uniform holes permeable to gaseous state molecules and impermeable to liquid and solid state molecules.

4,427,864

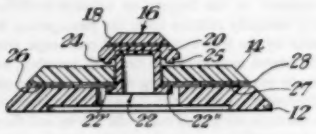
ELECTRICAL OUTLET SWITCH

Stanley M. Oster, 8120 NW. 73rd Ter., Tamarac, Fla. 33319

Continuation of Ser. No. 61,636, Jul. 30, 1979, abandoned. This application Sep. 24, 1982, Ser. No. 423,455

Int. Cl.³ H01H 9/00

U.S. Cl. 200—330 **2 Claims**



1. A reflective switch plate assembly, comprising:

a clear base plate with a through opening and a front surface and a rear surface;

a reflective material connected to said rear surface of said base plate;

a non-removable toggle switch lever extension means non-removably fixed in said opening for sliding reciprocal movement within said opening, said extension means having a front portion means with a rear side mid portion and a rear portion with a front side, said extension means for fitting over a toggle switch lever for controlling the position of the toggle switch lever by sliding said front portion means of said extension means back and forth over the surface of said base plate within said opening;

said extension means including two upper cams on said rear side of said front portion means for sliding contact with said front surface of said base plate of said switch plate assembly, said two cams causing wear marks on said front surface;

said front portion means for covering said wear marks in all positions and being larger in length than said two upper cams so that said wear marks left on said front surface of said base plate caused by friction of said two upper cams are covered;

said extension means having two lower cam means positioned on said front side of said rear portion, said two lower cam means positioned for movement against said reflective material on said surface of said base plate, said two lower cam means each having a width;

said two lower cam means positioned to make contact with the said reflective material spaced away from the sides of said opening a distance no greater than said width, said two lower cam means spaced from said opening and having said width for preventing chipping of said reflective material along said through opening for preventing visible marks;

said mid portion extends through said through opening and connecting said front portion means and said rear portion.

4,427,865

METHOD OF HEAT-BONDING INTERIOR MATERIAL

Hiroo Watanabe, Miura, Japan, assignor to Nissan Motor Company, Limited, Yokohama, Japan

Filed Sep. 3, 1981, Ser. No. 299,140

Claims priority, application Japan, Nov. 21, 1980, 55-163210

Int. Cl.³ H05B 6/54

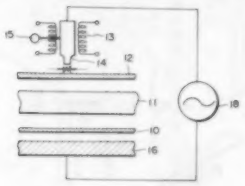
U.S. Cl. 219—10.41 **3 Claims**

1. A method of heat-bonding interior finishing material to foamed resin cushioning material with a high-frequency welder including a stationary electrode, a movable electrode, a high-frequency AC generator, and an electric heater associated with the movable electrode, which comprises the following steps of:

(a) pre-selecting a urethane foamed resin cushioning material having foam of nearly uniform cell size with a specific gravity of less than about 0.021 and an air permeability rate in the range of from about 80 to 250 cc/cm².sec with a thickness on the order of 1 cm;

(b) arranging a layer of the interior finishing material and a layer of the pre-selected foamed resin cushioning material to be bonded;

(c) heating the movable electrode of the high-frequency



welder by the electric heater to a temperature below a melting point of the outermost layer of the interior finishing material;

(d) pinching the arranged layers to be bonded between the heated movable electrode and the stationary electrode; and

(e) applying a high-frequency oscillating voltage to the movable and stationary electrodes from the high-frequency AC generator,

whereby a uniform heat-bond force, capable of withstanding the effects of high-temperature, high-pressure steam is obtained.

4,427,866

ROTARY ELECTRICAL COUPLING FOR MICROWAVE HEATING APPARATUS

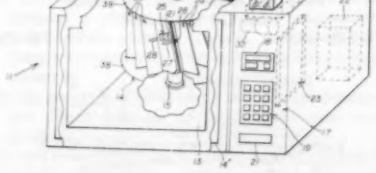
John A. Pauly, Milford, and John K. Malinoski, Westboro, both of Mass., assignors to Baxter Travenol Laboratories, Inc., Deerfield, Ill.

Filed Jan. 11, 1982, Ser. No. 338,637

Claims priority, application Switzerland, Dec. 31, 1981, 393469

Int. Cl.³ H05B 6/68

U.S. Cl. 219—10.55 B **12 Claims**



1. Microwave oven apparatus comprising:

housing means defining an oven chamber;

door means providing access to said chamber;

source means energizable to transmit microwave energy into said chamber;

support means rotatably mounted within said chamber and defining a plurality of heating stations for receiving articles to be heated;

drive means energizable to produce rotation of said support means;

temperature responsive sensor means mounted on said support means for rotation therewith, said sensor means comprising a plurality of temperature responsive sensors each positioned and arranged to sense the temperature of an article retained in a different one of said stations;

control circuit means mounted outside said chamber and adapted to control energization of said source means in response to signal output from said sensor means;

a rotary coupling assembly electrically connecting said circuit means to said sensor means, said coupling assembly comprising a substantially stationary portion mounted on said housing means and having substantially stationary contact means connected to said control circuit means and a rotary portion mounted on said support means and having rotary contact means connected to said sensor means, said rotary contact means slidably engaging said stationary contact means during rotational movement of said support means; and

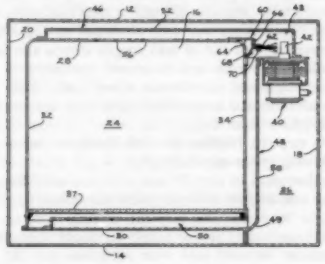
multiplexer means mounted on said support means within said chamber and having an input connected to receive output signals from all of said sensors, said multiplexer means having an output connected to said rotary contact means and adapted to sequentially transmit thereto all of said output signals in a predetermined sequence.

4,427,867

POWER DIVIDER FOR MICROWAVE OVEN

Raymond L. Dills, Louisville, Ky., assignor to General Electric Company, Louisville, Ky.

Filed Dec. 3, 1982, Ser. No. 446,553
Int. Cl.³ H05B 6/70
U.S. Cl. 219—10.55 F **4 Claims**



1. A food cooking microwave oven comprising:

an oven cavity including a top wall, a rear wall, side walls and an access front opening;

a housing at the intersection of said top wall and one of said side walls;

a first waveguide extending from said housing along said top wall;

a second waveguide extending downwardly from said housing along said one of said side walls and said bottom wall;

microwave generator means including a probe in said housing being operable for supplying microwave heating energy to said waveguides;

means for selectively controlling respective amounts of said microwave heating energy to said first waveguide and said second waveguide including:

a bifurcator positioned in said housing intermediate said probe and said first and second waveguides having a thermally powered bimetallic deflector means;

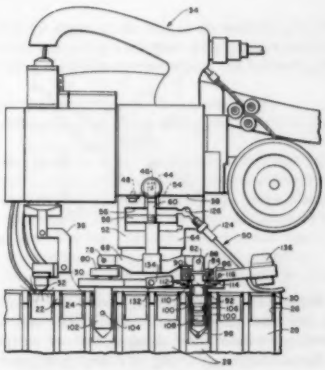
heating means arranged on said bimetallic deflector of said bifurcator for applying heat to said deflector, control means including selector means operable to control the output of said heating means to vary the flexing of said bimetallic deflector relative to said waveguide to cause its movement selectively between a position of directing most of said microwave energy into said first waveguide to a position of directing most of said microwave energy into said second waveguide to thereby control the ratio of microwave energy between said first waveguide and said second waveguide.

4,427,868

MOUNTING FIXTURE FOR AN AUTOMATIC WELDING APPARATUS

Gasparas Kazlauskas, 10219 Briarwood Dr., Los Angeles, Calif. 90024

Filed Feb. 1, 1982, Ser. No. 344,828
Int. Cl.³ B23K 9/02
U.S. Cl. 219—60.2 **17 Claims**



1. A mounting fixture for an automatic welding apparatus for welding tubes to a tubesheet comprising:

a housing;

a mandrel assembly mounted by mounting means on said housing, said mandrel assembly including engaging means for tightly connecting with a fixed structure, said mounting means permitting limited movement of said housing relative to said mandrel assembly along a line parallel to the surface of said tubesheet

indexing means attached to said housing, said indexing means to connect with a portion of said tubesheet, said indexing means to ascertain the center of said portion and position said housing a precise distance from said center which causes said housing to move by said mounting means within the confines of said limited movement in respect to said mandrel assembly; and

position fixing means actuatable to fix together said housing and said mandrel assembly the position of which has been established by said indexing means, said position fixing means to be releasable to permit relative movement between said housing and said mandrel assembly.

4,427,869

METHOD FOR MANUFACTURING PANEL ASSEMBLIES FOR AUTOMOBILES

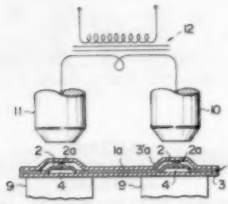
Toshio Kimura; Kunitoshi Katsoka; Yoshiaki Yamaji; Hiromi Iwasaki, and Shinichi Yamashita, all of Hiroshima, Japan, assignors to Toyo Kogyo Co., Ltd., Hiroshima, Japan

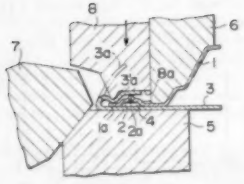
Continuation of Ser. No. 221,671, Dec. 1, 1980, abandoned. This application Sep. 30, 1982, Ser. No. 428,524

Claims priority, application Japan, Dec. 4, 1979, 54-157167

Int. Cl.³ B23K *11/00*

U.S. Cl. 219—93 **8 Claims**





1. Method for manufacturing a panel assembly comprised of outer and inner panels, said method comprising the steps of:

forming the inner panel along at least one peripheral portion thereof with a plurality of raised portions raised in one direction;

forming each of raised portions with at least one projection projecting in said one direction;

placing the inner panel on the outer panel with the raised portions and the projections directed opposite to the outer panel and with a peripheral portion of the outer panel extending beyond the peripheral portion of the inner panel;

folding the peripheral portion of the outer panel over the peripheral portion of the inner panel so that the peripheral portion of the outer panel is laid over the raised portions of the inner panel;

applying anvils to the outer panel at portions corresponding to the raised portions; and

applying welding electrodes to the peripheral portion of the outer panel at portions corresponding to the raised portions of the inner panel so as to depress the folded peripheral portion of the outer panel to the raised portion while simultaneously applying welding current in series through at least two of the welding electrodes for welding the folded peripheral portion of the outer panel to the raised portions of the inner panel.

4,427,870

METHOD OF AND APPARATUS FOR ELECTROEROSIVELY MACHINING A CONDUCTIVE WORKPIECE WITH A CONTINUOUS WIRE ELECTRODE

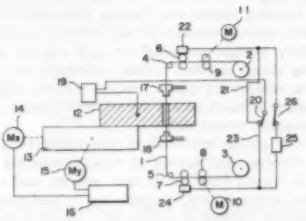
Kiyoshi Inoue, Tokyo, Japan, assignor to Inoue-Japax Research Incorporated, Yokohama, Japan

Filed Jul. 1, 1981, Ser. No. 279,312

Claims priority, application Japan, Jul. 4, 1980, 55-90670

Int. Cl.³ B23P *1/08*

U.S. Cl. 219—69 W **15 Claims**



1. A method of electroerosively machining an electrically conductive workpiece with a continuous wire electrode, comprising the steps of:

(a) disposing the wire electrode in a predetermined path of continuous wire travel commencing with a wire supply means and ending with a wire collector means and including a pair of machining guide members defining a straight line path therebetween; thereafter

(b) positioning said workpiece to locate a predetermined cutting-start point thereon for a given electroerosive-machining course in alignment with said straight line path;

(c) axially driving said wire electrode to cause it to be progressively fed out of said supply means and fed into said collector means and to travel continuously along said predetermined continuous travel path while applying a predetermined tension thereto at least across said machining guide members;

(d) in step (b), heating the wire electrode between said machining guide members; and

(e) subsequent to step (b) and termination of step (d), initiating said course of electroerosive machining of said workpiece by continuing step (c), passing from an electroerosion machining power supply an electroerosion machining current between said wire electrode and the workpiece across a machining gap flushed with a machining liquid and initiating relative displacement between the axially travelling wire electrode and the workpiece along a prescribed path commencing with said cutting-start point the wire electrode being heated in step (d) so as to place it in a thermal condition substantially equivalent to that in which it is when engaged in said electroerosive machining course of step (e).

4,427,871

ELECTRIC DISCHARGE MACHINE CURRENT CUTOFF CONTROL

Robert W. Drushel, Farmington Hills, and Raymond Bercaw, Royal Oak, both of Mich., assignors to Ex-Cell-O Corporation, Troy, Mich.

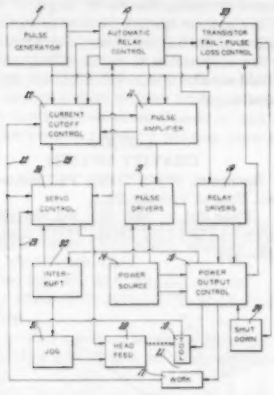
Filed Sep. 1, 1981, Ser. No. 298,546

Int. Cl.³ B23P *1/02*

U.S. Cl. 219—69 P **6 Claims**

1. A power supply system for electric discharge machining comprising, in combination, a pulse generator operative to provide a pulsating control emf and including means to vary the duration of the emf pulses and the period of the said pulses; power control means responsive to the pulse generator to

deliver power pulses to an electric discharge machining gap synchronized with the control emf pulses; discriminator means responsive to a condition indicative of abnormal gap operation effective to interrupt the delivery of power pulses in response to said condition; probe pulse generating means triggered by the control emf to deliver probe pulses synchronized with the control emf pulses; first probe pulse cutoff means effective to determine a maximum probe pulse duration; second probe



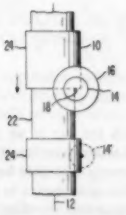
pulse cutoff means responsive to control emf pulse duration effective to determine a probe pulse duration below the maximum when control emf pulse duration is below a predetermined value; and means responsive to operation of the discriminator means to couple the probe pulse generating means to the power control means to effectuate synchronization of the power pulses with the probe pulses instead of the control emf pulses.

4,427,872

PRECISION MACHINING APPARATUS AND METHOD UTILIZING A LASER

Richard J. Saunders, San Jose, Calif., assignor to Coherent, Inc., Palo Alto, Calif.

Filed Sep. 22, 1978, Ser. No. 944,868
Int. Cl.³ B23K *27/00*
U.S. Cl. 219—121 LH **27 Claims**



1. Apparatus for machining the outside diameter of a generally cylindrical workpiece comprising:

a laser;

support means for axially engaging the cylindrical workpiece and rotating the workpiece about its axis;

delivery means for directing the output beam from said laser along a chordal path through the rotating workpiece and wherein said delivery means includes means for directing the laser beam in a plane perpendicular to the axis of the workpiece;

means for moving the laser beam relative to the workpiece in a direction parallel with the rotational axis of the workpiece whereby material from the rotating workpiece is removed by the action of the laser beam; and

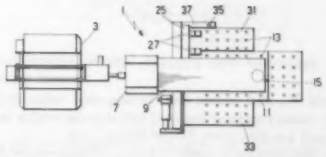
means for selectively energizing and de-energizing said laser to selectively cut the workpiece to form non-uniform outside diameters along the length of the workpiece.

4,427,873

METHOD AND APPARATUS FOR ALIGNING AXES OF ASSISTING GAS NOZZLES WITH LASER BEAM AXES IN LASER PROCESSING MACHINES

Naoki Orita, Fullerton, and Toshiyuki Matsumoto, Irvine, both of Calif., assignors to Amada Engineering & Service Co., La Mirada, Calif.

Filed Mar. 18, 1982, Ser. No. 359,302
Int. Cl.³ B23K *27/00*
U.S. Cl. 219—121 LK **9 Claims**



1. A method for aligning the axis of an assisting gas nozzle with a laser beam axis using a test piece in apparatus which uses a laser to process workpieces, comprising the following steps, in sequence:

piercing the test piece by laser beam emissions;

jetting assisting gas from the assisting gas nozzle to the test piece;

detecting the pressure of the assisting gas flowing through the pierced test piece by means of a pressure detector; and

adjusting the assisting gas nozzle in a plane perpendicular to the axis of the laser beam until the detected pressure of the assisting gas flowing through the pierced test piece reaches a maximum value at a maximum position,

whereby the axis of the assisting gas nozzle will be in alignment with the axis of the laser beam.

4,427,874

PULSE ARC WELDING MACHINE

Youichiro Tabata; Shigeo Ueguri, both of Hyogo; Takaji Mizuno, and Masanori Mizuno, both of Aichi, all of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 8, 1981, Ser. No. 281,260
Claims priority, application Japan, Jul. 8, 1980, 55-93097
Int. Cl.³ B23K *9/09*
U.S. Cl. 219—130.51 **7 Claims**

1. A pulse arc welding machine comprising:

a consumable wire electrode;

a wire feeding unit for feeding said consumable wire electrode toward a base material;

a base current source for supplying a base current flowing between said consumable wire electrode and said base material;

a pulse current source for supplying a pulse current superposed on said base current flowing between said consumable wire electrode and said base material;

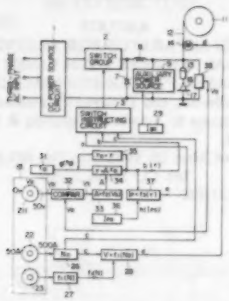
means for setting a frequency of said pulse current;

a sensor for detecting an arc discharge voltage between said consumable electrode and said base material;

means for correcting a quantity of heat applied to said elec-

trode comprising means for comparing an output detection signal V_d produced by said sensor with a predetermined arc voltage V_a to produce a difference signal V_s;

means operating in response to said difference signal V_s for producing a pulse width instruction signal for setting a pulse width of said pulse current comprising means for supplying a value representing an initial pulse width, an amplification factor computing circuit for producing an amplification factor signal in response to said difference



signal V_s, and means for varying said value representing said value representing said initial pulse width in response to said amplification factor signal, and

means for setting a peak current of said pulse current in response to said difference signal V_s comprising means for supplying a value representing a minimum peak current and a peak current computing circuit for setting said peak current in response to said value representing said minimum peak current and said pulse width instruction signal.

4,427,875

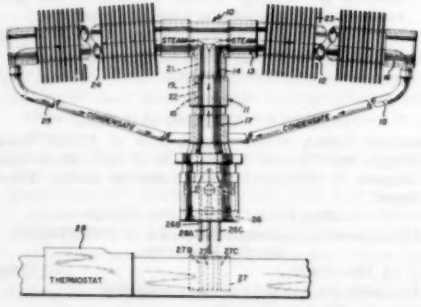
ELECTRIC STEAM RADIATOR SPACE HEATING UNIT

Robert J. Fleming, 25 Shadowbrook La., Milford, Mass. 01757

Filed Jun. 26, 1981, Ser. No. 277,826

Int. Cl.³ F24H *3/06;* **F22D** *1/28;* **F24D** *13/04*

U.S. Cl. 219—341 **3 Claims**



1. Heating unit, comprising:

(a) an elongated, substantially-vertical stack,

(b) a generally elongated, horizontal heat exchange tube having heat exchange fins and having one end connected to and communicating with the upper end of said stack,

(c) an inclined condensate tube joining the other end of said heat exchange tube to and in communication with a lower portion of said stack, said heat exchange tube sloping downwardly slightly from the top of said stack to the condensate tube, the heat exchange tube, condensate tube, and stack being joined in series to form a closed circuit for thermosyphonic action,

(d) a quantity of vaporizable liquid in said stack and condensate tube, and

(e) an electrical heating element located in said stack to vaporize the liquid, the vapor flowing upwardly through said stack into said heat exchange tube where it condenses and the resulting liquid flows downwardly through said condensate tube to said lower portion of said stack, said stack having a cylindrical bore, said heating element having a generally cylindrical surface and being mounted concentrically of the stack bore and extending the entire length of the stack, thus defining a thin annular space between the surface of the bore and the surface of the heating element, said liquid flowing into said space for conversion to vapor filling only the bottom portion of said annular space, whereby the vapors generated become superheated.

4,427,876

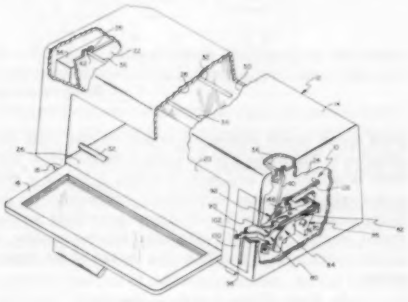
GRAVITY SWITCH

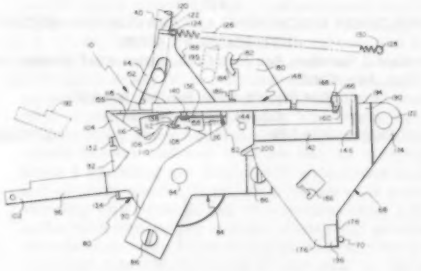
Robert W. Bonacorsi, North Wales, Pa., assignor to Proctor-Silex, Inc., King of Prussia, Pa.

Filed Oct. 7, 1981, Ser. No. 309,299

Int. Cl.³ A47J *37/08;* **H01H** *37/52;* **H05B** *1/02*

U.S. Cl. 219—413 **17 Claims**





1. A gravity switch for use in an appliance having means displaceable between a normal relaxed position and a displaced position, the switch being operable between an OFF position for locating the displaceable means in the relaxed position and an ON position for enabling the displaceable means to move from the relaxed position to the displaced position, the switch comprising:

(A) structure means fixed in the appliance for supporting the switch;

(B) selector means movably mounted on said structure means and being manually movable from the OFF position to the ON position;

(C) releasable latching means operable for holding said selector means in the ON position;

(D) restoring means operable with said releasable latching

means for automatically returning said selector means from the ON position to the OFF position; and

(E) an imbalanced weight member pivotally mounted and having a majority of mass located to one side of the pivot mount, said imbalanced weight member being operable in a first position wherein said selector means in the OFF position supports said imbalanced weight member against the pull of gravity, a second position wherein the displaceable means supports said imbalanced weight member against the pull of gravity with said selector means in the ON position and a third position wherein said imbalanced weight member actuating said restoring means to initiate return of said selector means from the ON position towards the OFF position, and said imbalanced weight member being pivoted from said first position towards said second position and from said second position towards said third position under the pull of gravity.

4,427,877

PRINTING ON LOW SURFACE ENERGY POLYMERS

Vijay K. Dhingra, Foster City, Calif., assignor to Raychem Corporation, Menlo Park, Calif.

Filed Sep. 28, 1981, Ser. No. 306,265
Int. Cl.³ H05B 3/10; H01C 7/10; B32B 27/00
U.S. Cl. 219—548 14 Claims

1. An article having a surface portion which

(a) is composed of a void free melt-extruded composition comprising

(i) an organic polymer component which has a surface energy of less than 24 dynes/cm and

(ii) a particulate filler component comprising particles which have at least two dimensions in the range of 1 to 40 microns, the amount of the filler component being 2 to 20% by volume of the composition;

(b) has surface irregularities which are created by said particles; and

(c) has firmly adherent markings thereon of a printing ink.

14. An article according to claim 1 which is in the form of an electrically insulating jacket around a self-regulating heater comprising at least two electrodes which are electrically connected by an element composed of a conductive polymer composition which exhibits PTC behavior.

4,427,878

OPTICAL SCANNING APPARATUS INCORPORATING COUNTER-ROTATION OF ELEMENTS ABOUT A COMMON AXIS BY A COMMON DRIVING SOURCE

Michael E. Buchtel, Costa Mesa, and Ronald T. Honda, Irvine, both of Calif., assignors to Ford Aerospace & Communications Corporation, Detroit, Mich.

Filed Nov. 6, 1981, Ser. No. 319,010
Int. Cl.³ G01V 1/20
U.S. Cl. 250—203 R 10 Claims

1. An optical scanning apparatus including:

means providing a concave primary mirror disposed to focus an image within the field of view of said primary mirror at a central optical axis;

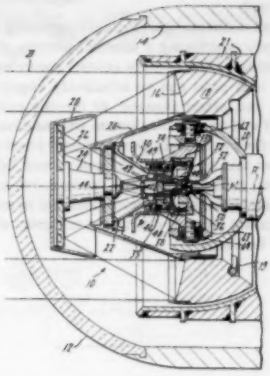
detector means disposed on said optical axis for receiving said focused image and responsively outputing an electrical signal;

means providing a secondary mirror interconnected with and displaced from said primary mirror on said optical axis to direct said focused image towards said detector means;

means for rotating said primary and secondary mirror providing means at a first rate and direction about said optical axis;

means intermediate said secondary mirror and said detector means for optically relaying said directed focused image to said detector means; and

means connected to said providing means for responsively rotating said optical relaying means about said optical axis at a rate that is directly proportional to said first rate and in a direction that is opposite to the rotation of said rotational direction of said primary and secondary mirror providing means.

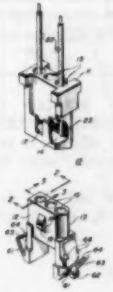


4,427,879

OPTOELECTRONIC CONNECTOR ASSEMBLY

James V. Becher, Naperville, and Tedford H. Spaulding, Norridge, both of Ill., assignors to Allied Corporation, Morris Township, Morris County, N.J.

Division of Ser. No. 569,578, Apr. 18, 1975. This application Apr. 1, 1977, Ser. No. 783,754
Int. Cl.³ H01J 39/12
U.S. Cl. 250—215 24 Claims



1. An optoelectronic connector assembly comprising an electrical connector part and an optical connector part, said parts each including a housing formed of resilient material, one housing being formed with a keyway therewithin and the other housing having a mating key for engaging with said keyway, a first of said housings having an interlock recess therein and a second of said housings having protuberance means formed thereon for engagement with said recess so that both of said housings can positively engage with each other and so that such engaged housings can be manually disengaged from each other,

said electrical connector part housing being formed with a socket receiving cavity,

said electrical connector part further comprising first means for firmly positioning a photo-electric transducer element in said socket receiving cavity; and

said optical connector part housing being formed with a pin contact receiving cavity, said pin contact receiving cav-

ity, said pin contact receiving cavity being aligned with the socket receiving cavity of said electrical connector part housing when said housings are engaged with each other, and

said optical connector part further comprising second means for firmly positioning a terminal portion of a fiber optic light guide within said pin contact receiving cavity,

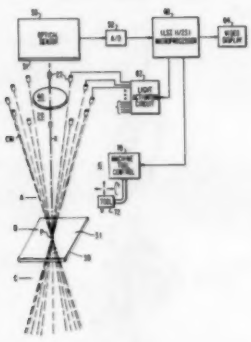
whereby said parts can be selectively engaged and disengaged, and, when engaged, to thereby produce engagement of said transducer element with said terminal portion of said fiber optic light guide without physical adjustment of either said transducer element or said light guide portion, and wherein potential damage due to contact between said transducer element and said terminal portion is significantly reduced due to the resiliency of the material of said housings.

4,427,880

NON-CONTACT VISUAL PROXIMITY SENSING APPARATUS

Takeo Kanade, and Haruhiko Asada, both of Pittsburgh, Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jun. 29, 1981, Ser. No. 278,518
Int. Cl.³ G01B *11/24*
U.S. Cl. 250—222.1 **11 Claims**



1. Apparatus for determining the location and orientation of an object, comprising:

a plurality of light sources disposed in spaced apart relationship from said object,

a light source activation means operatively connected to said plurality of light sources to sequentially activate said light sources causing a series of light beams to impinge on said object,

light responsive transducer means having a two dimensional light sensitive area positioned relative to said object to receive the reflected light beams from said object and develop output signals in response to each of said reflected light beams, each of said output signals being indicative of the location on said light sensitive area contacted by the respective reflected light beams; and

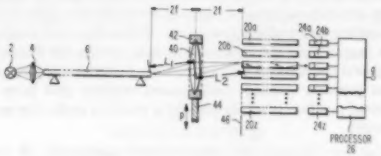
signal processing means responding to said output signals by identifying a pattern of output signals and determining therefrom the location and orientation of said object.

4,427,881

SENSOR DEVICE FOR MEASURING A PHYSICAL PARAMETER

Hartwig Ruell, Fürstenfeldbruck, Fed. Rep. of Germany, assignor to Siemens Corporation, Iselin, N.J.

Filed Mar. 9, 1981, Ser. No. 241,632
Int. Cl.³ G01D *5/30*
U.S. Cl. 250—227 **4 Claims**



1. A sensor device for measuring a physical parameter, said device comprising in combination:

(a) a source of light

(b) a plurality of light-transmitting fibers each having an input end for receiving light and an output end for emitting the light received at said input end and conducted through said fiber;

(c) a plurality of light detectors, each respectively associated with one of said output ends of said light-transmitting fibers, for receiving light therefrom and indicating the value of said physical parameter;

(d) lens means for receiving light from said source and for focusing said light on one of said input ends of said light-transmitting fibers;

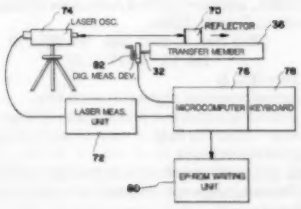
(e) means for displacing said lens means with respect to said input ends of said light-transmitting fibers in dependence upon said physical parameter, said lens means projecting said light to a specific one of said input ends of said fibers in accordance with the value of said physical parameter.

4,427,882

DIGITAL MEASURING DEVICE

Touru Nakaoki, and Hiroshi Uno, both of Tokyo, Japan, assignors to Mutoh Industry Ltd., Tokyo, Japan

Filed Aug. 25, 1981, Ser. No. 296,060
Claims priority, application Japan, Oct. 24, 1980, 55-149048
Int. Cl.³ G01D *5/34*
U.S. Cl. 250—231 SE **3 Claims**



1. A digital measuring device wherein a transfer quantity of a transfer member is digitally measured by the rotation of a lead screw of the machine, said digital measuring device comprising means for converting a rotational motion quantity of the lead screw to a pulse digital count signal, a microcomputer wherein accurate measured transfer data of said transfer member with said pulse digital count signal being used as an address signal has been previously stored and wherein when said pulse digital count signal is inputted, a digital output signal corresponding to the accurate transfer quantity of said transfer member is outputted on the basis of said previously stored

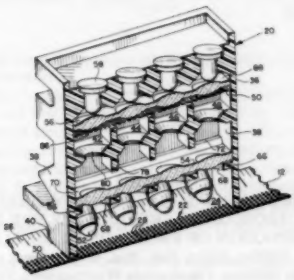
measured transfer data corresponding to said pulse digital count signal, and further comprising a display unit for displaying said digital output signal of said microcomputer.

4,427,883

OPTICAL SENSING SYSTEM FOR EXTENSIBLE TAPE RULES

Ellis I. Betensky, New York, N.Y., and William J. Hildebrandt, Simsbury, Conn., assignors to The Stanley Works, New Britain, Conn.

Filed May 27, 1981, Ser. No. 267,632
Int. Cl.³ H01J *3/14*
U.S. Cl. 250—237 G **13 Claims**



1. An optical sensing system for coilable extensible tape rules and the like comprising a movable elongated tape blade having optical markings forming a grid along the length thereof, photoelectric detector means spaced from said grid, a light source for illuminating a portion of said grid as it moves relative to said detector means, an optical mask between said grid and said detector means, objective lens means intermediate said tape grid and said optical mask, said lens means being effective to focus a sharp clear image of said illuminated grid portion on said optical mask whereby said mask provides a uniform modulation of the light image signal through said mask, and field lens means immediately adjacent and downstream of said mask for concentrating the light signal passing through and modulated by said optical mask into a composite signal and for directing the concentrated composite signal onto said detector means.

4,427,884

METHOD FOR DETECTING AND QUANTIFYING CARBON ISOTOPES

Michael Anbar, Buffalo, and Robert C. Abbott, Williamsville, both of N.Y., assignors to The Research Foundation of State University of New York, Albany, N.Y.

Filed Jan. 25, 1982, Ser. No. 342,147
Int. Cl.³ B01D *59/44*; H01J *49/26*
U.S. Cl. 250—283 **14 Claims**

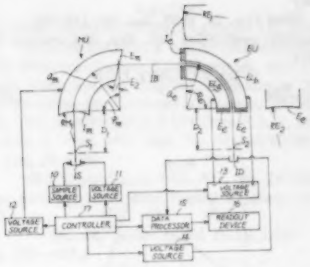
1. A method for detecting and quantifying a carbon isotope at quantities of less than 1×10^{-12} gram at a statistical precision of better than 5% within a time period of less than about five minutes, said method comprising producing a carbon compound selected from the group consisting of elemental carbon, CO, CS_2 and CO_2 from the carbon containing composition to be analyzed and producing and detecting sufficient C^- ions from the carbon compound at a known efficiency to provide at least 80 counts per minute by mass spectrometry of ions of the carbon isotope to be detected and quantified.

4,427,885

DOUBLE FOCUSSING MASS SPECTROMETER

Takehiro Takeda, Kyoto, Japan, assignor to Shimadzu Seisakusho Ltd., Kyoto, Japan

Filed Nov. 27, 1981, Ser. No. 325,189
Int. Cl.³ H01J *49/32*
U.S. Cl. 250—296 **3 Claims**



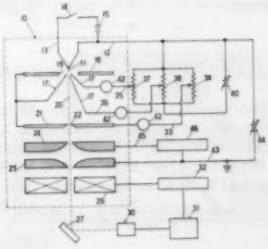
1. A double focussing mass spectrometer comprising an ion optical system having an entrance slit and an exit slit and an ion detector, said ion optical system comprising a series combination of an energy dispersing unit and a mass dispersing unit, said energy dispersing unit comprising a toroidal electric field having a deflection angle of 85° to 95° and a toroidal constant of 0.45 to 0.55, and said mass dispersing unit comprising a homogeneous magnetic field having a deflection angle of 85° to 95°, a concave entrance end face having a radius of curvture of $-a_m$ to $-\frac{1}{2}a_m$ where a_m is the ion orbital radius in said magnetic field, and a flat exit end face inclined at an angle of 6° to 14° to the negative side from a position perpendicular to the optical axis of said ion optical system, the ratio a_e/a_m where a_e is the ion orbital radius in said electric field, being between 0.75 and 0.9 and the distance between the entrance end face of said magnetic field and said entrance slit being between $0.85a_m$ and $1.25a_m$.

4,427,886

LOW VOLTAGE FIELD EMISSION ELECTRON GUN

Joe A. Martin, and Max G. Lagally, both of Madison, Wis., assignors to Wisconsin Alumni Research Foundation, Madison, Wis.

Filed Aug. 2, 1982, Ser. No. 404,398
Int. Cl.³ G01N *23/225*; H01J *19/24, 19/32, 29/46*
U.S. Cl. 250—310 **30 Claims**



1. A field emission electron gun, comprising:
(a) a sharply pointed cathode tip;
(b) at least one sharply pointed extraction electrode tip disposed with the point thereof proximate to the point of the cathode tip; and
(c) means for applying a voltage between the cathode tip and

the extraction electrode tip sufficient to cause field emission of electrons from the cathode tip.

4,427,887

METHOD FOR QUENCH CORRECTION IN LIQUID SCINTILLATION COUNTERS

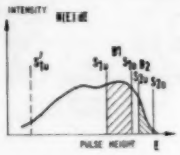
Fritz Berthold, 753 Pforzheim, Weissenburgstr. 12 a, Fed. Rep. of Germany

Filed Dec. 24, 1980, Ser. No. 219,820

Claims priority, application Fed. Rep. of Germany, Dec. 24, 1979, 2952321

Int. Cl.³ G01T *1/20*

U.S. Cl. 250—328 **28 Claims**



1. In a method for determining the quench corrected counting yield of samples which emit ionizing radiation that is subject to quenching in a liquid scintillation counter, wherein the output signal of a photoelectric transducer device is used to measure the counting rates of the sample energy spectrum in different given pulse height ranges, and a value characteristic for the quenching is derived from the measurement to determine a quench corrected counting yield, the improvement wherein the value characteristic for the quenching is derived by: assigning a given numerical relationship between the counting rates in different given pulse height ranges; choosing a shift parameter which when varied causes a relative shift between the given pulse height ranges, and the sample spectrum; effecting the relative shift by varying the shift parameter until the counting rates take on the given numerical relationship; and determining the shift parameter value that produces the given numerical relationship as the value characteristic for the quenching.

4,427,888

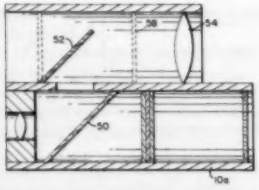
INFRARED IMAGING SYSTEM

Aaron A. Galvin, Lexington, Mass., assignor to American District Telegraph Company, New York, N.Y.

Filed Aug. 10, 1981, Ser. No. 291,492

Int. Cl.³ H01J *31/49, 31/50*

U.S. Cl. 250—331 **12 Claims**



1. An infrared imaging system comprising:

a liquid crystal structure having a surface for absorbing infrared radiation from a radiating object, and a viewing surface for providing an image representative of the temperature profile of received infrared radiation;

means for biasing the liquid crystal material to a temperature level above the ambient temperature range and just below the temperature at which the color of the liquid crystal material changes from black;

an objective lens disposed in spaced relationship with the radiation absorbing surface of said structure and operative to image infrared radiation from an object being viewed onto said absorbing surface;

an eyepiece lens disposed in spaced relationship with the viewing surface of said structure and operative to provide to a user a magnified version of the image provided thereon; and

a visual channel providing a visual image of an object being viewed in superposition with the infrared temperature profile thereof, said visual channel including an objective lens operative to provide a visual image of the object being viewed and means for coupling the visual image to said eyepiece lens for the viewing of the visual image in superposition with the infrared temperature profile thereof.

4,427,889

METHOD AND APPARATUS FOR MOLECULAR SPECTROSCOPY, PARTICULARLY FOR THE DETERMINATION OF PRODUCTS OF METABOLISM

Gerhard J. Müller, Aalen, Fed. Rep. of Germany, assignor to Carl Zeiss Stiftung, Oberkochen Wierttemberg, Fed. Rep. of Germany

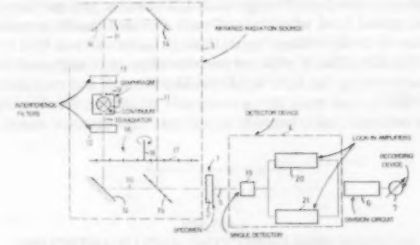
PCT No. PCT/DE80/00119, § 371 Date Apr. 23, 1981, § 102(e) Date Apr. 17, 1981, PCT Pub. No. WO81/00622, PCT Pub. Date Mar. 5, 1981

PCT Filed Aug. 12, 1980, Ser. No. 253,926

Claims priority, application Fed. Rep. of Germany, Aug. 23, 1979, 2934190

Int. Cl.³ G01J *1/00*

U.S. Cl. 250—339 **13 Claims**



1. A method for the spectroscopic determination of glucose concentration in an unpretreated multi-component specimen selected from the group of whole blood and urine which comprises the steps of:

(a) simultaneously measuring the absorption values of infrared radiation by said specimen at a first wavelength lying within the infrared spectral range of 940 to 950 cm^{-1} and a second wavelength lying within the infrared spectral range of 1090 to 1095 cm^{-1}; and

(b) standardizing the measurement by forming the quotient of the absorption values of the first and second wavelengths:

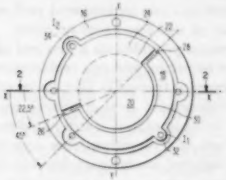
whereby the glucose concentration is proportional to the absorption value measured at second wavelength, and the absorption value measured at said first wavelength is essentially independent of said concentration.

4,427,890

DOSE MONITOR CHAMBER FOR ELECTRON OR X-RAY RADIATION

Leonhard Taumann, Lafayette, Calif., assignor to Siemens Medical Laboratories, Inc., Walnut Creek, Calif.

Filed Aug. 3, 1981, Ser. No. 289,137
Int. Cl.³ H01J 47/02
U.S. Cl. 250—385 9 Claims



1. A dose monitor chamber for X-rays or electrons, comprising in combination:

(a) a first electrode which is formed as a portion of a first flat ring, said first electrode being arranged in a first plane;

(b) a second electrode which is formed as a flat circular disk contacting along its periphery the periphery of a portion of a second flat ring, said second electrode being arranged in said first plane at a distance from said first electrode, whereby said portion of said first ring and said portion of said second ring extend together over approximately 360°; and

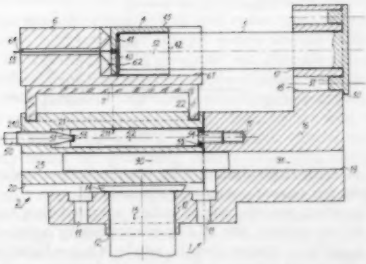
(c) a third electrode arranged in a second plane parallel to and spaced from said first plane.

4,427,891

VARIABLE TEMPERATURE STAGE DEVICE FOR ELECTRON MICROSCOPE

Adrien J. P. Georges, 41, av. Plaine Fleurie, and Jean-Pierre Gonchond, 59 A, rue des Ayguinards, both of Meylan, France 38240

Filed Sep. 10, 1980, Ser. No. 185,950
Claims priority, application France, Sep. 20, 1979, 79 23437
Int. Cl.³ H01J 37/20
U.S. Cl. 250—443.1 18 Claims



1. A variable temperature stage device for an electron microscope including a goniometer, said stage device comprising:

means detachable from the goniometer for supporting a specimen holder,

means connected with said goniometer for selectively cooling said specimen holder,

means for selectively heating said specimen holder,

a flexible metal joint crushed between said cooling means and specimen holder,

a clamping structure, and

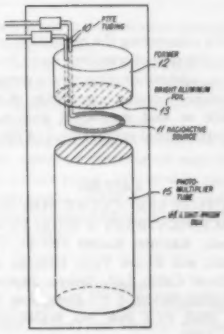
heat insulating means for supporting said specimen holder and affixed to said detachable supporting means to be connected by said clamping structure in abutting relation to a portion of said specimen holder, said clamping structure holding the cooling means against said flexible metal joint, in turn held in place against the specimen holder by a force exerted through the metal joint by the cooling means.

4,427,892

DETECTION AND DETERMINATION OF SPECIES BY FLUORESCENCE MEASUREMENTS

David J. Malcolme-Lawes, Loughborough, and Lawrence A. Gifford, Bury, both of England, assignors to National Research Development Corporation, London, England

PCT No. PCT/GB80/00098, § 371 Date Feb. 9, 1981, § 102(e) Date Feb. 9, 1981, PCT Pub. No. WO80/02746, PCT Pub. Date Dec. 11, 1980
PCT Filed Jun. 6, 1980, Ser. No. 237,140
Claims priority, application United Kingdom, Jun. 7, 1979, 7919852
Int. Cl.³ G01N 23/00; G21K 5/00
U.S. Cl. 250—458.1 9 Claims



1. A method of detecting or determining a species contained in the flowing liquid eluant of a chromatographic separation, which comprises providing a ^{147}Pm or ^{63}Ni source of beta-particles, generating visible fluorescent radiation in the eluant by the action of the beta-particles thereon, causing the eluant to flow between the source of beta-particles and a light-sensitive detection means, so that fluorescent radiation generated in the eluant is detected, and a count rate thereof is measured, by the detection means, optically filtering said radiation to select particular wavelengths for detection by said detection means and monitoring the output of the detection means.

4,427,893

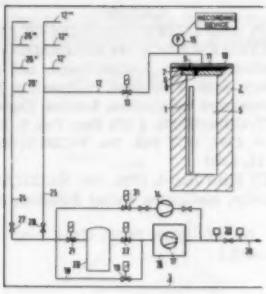
APPARATUS AND METHOD FOR STORING SPENT FUEL ASSEMBLIES

Horst Queiser, Maintal, and Bernd Eckardt, Bruchköbel, both of Fed. Rep. of Germany, assignors to Kraftwerk Union Aktiengesellschaft, Mülheim, Fed. Rep. of Germany

Filed Dec. 10, 1980, Ser. No. 215,136
Claims priority, application Fed. Rep. of Germany, Dec. 13, 1979, 2950198
Int. Cl.³ G21F 5/00
U.S. Cl. 250—506.1 10 Claims

1. Apparatus for storing spent fuel assemblies of a nuclear reactor including a plurality of fuel-assembly transport casks, respectively, having a hollow chamber for receiving therein at least one fuel assembly and having a cover for gas-tightly closing off an opening in the hollow chamber, comprising means for supplying a trace gas into the hollow chamber, an additional cover defining a leakage detection chamber covering the cross-section of the opening to the hollow chamber and

susceptible to receipt of leakage therein from within the hollow chamber and from the outside, and a measuring device for the trace gas connected to said leakage detection chamber for monitoring gas-tightness of the closure of the opening to the hollow chamber and for differentiating between leakage from within the hollow chamber and from the outside, means including valves for connecting the respective leakage detection chambers of the plurality of transport casks in common to said measuring device, said connecting means comprising connecting lines respectively forming a grouping of all the transport casks connectible to said measuring device, said grouping being adapted to the spatial arrangement of the transport casks.



4,427,894

PORT SECTION STRUCTURE FOR MOUNTING REPLACEMENTS ON A SHIELDING BOX

Mitsugu Sunaoshi, Katsuta; Koichi Tokoro, Hitachi; Takeshi Natori, Ibaraki, and Kojiro Yuki, Hitachi, all of Japan, assignors to Hitachi Cable, Ltd., Tokyo, Japan

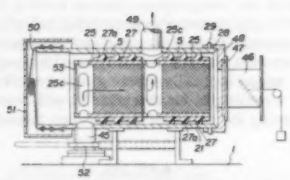
PCT No. PCT/JP80/00139, § 371 Date Nov. 7, 1980, § 102(e) Date Nov. 7, 1980, PCT Pub. No. WO80/02890, PCT Pub. Date Dec. 24, 1980

PCT Filed Jun. 20, 1980, Ser. No. 224,519

Claims priority, application Japan, Jun. 21, 1979, 54-78582

Int. Cl.³ G21F 7/04

U.S. Cl. 250—515.1 **4 Claims**



1. A port structure for use on a shielding box to support a replacement port and to enable sealed replacement thereof, said port structure comprising:

a fixed port member having a duct operable to be fixedly sealingly connected to the interior of a shielding box and an exhaust duct connected to the atmosphere, said fixed member having a smooth inner surface defining an elongated passage;

a plurality of replacement port members positioned axially serially within said passage within said fixed port member;

each said replacement port member having a uniform outer surface having firmly fixed thereto an elastic member having extending therefrom a plurality of axially spaced elastic ring members sealingly contacting said smooth inner surface of said fixed port member;

each said replacement port member including an internal portion receiving therein a filter member and a portion having therein at least one slit;

said plurality of replacement port members being positioned within said fixed port member such that during use of the shielding box, air from the shielding box passes through said duct of said fixed port member and said slit in one replacement port member, through said filter member in said one replacement port member to be purified thereby, and through said slit in the said replacement port member next adjacent said one replacement port member and said exhaust duct of said fixed port member;

flexible bag means provided on a first end of said fixed port member for receiving said one replacement port member, upon replacement thereof in said use position by said next adjacent replacement port member, upon axial sliding movement being imparted to said plurality of replacement port members in a direction from a second end of said fixed port member toward said first end thereof; and

pressure control damper means provided at said second end of said fixed port member for maintaining the internal pressure within the shielding box within a predetermined pressure range.

4,427,895

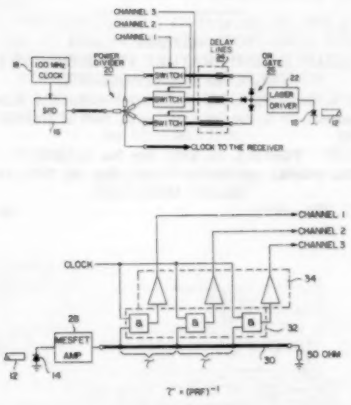
METHOD AND APPARATUS FOR OPTICAL FIBER COMMUNICATION OPERATING AT GIGABITS PER SECOND

Sverre T. Eng, Box 341, S-43900 Onsala, Sweden

Filed Jun. 12, 1981, Ser. No. 272,969

Int. Cl.³ H04B 9/00

U.S. Cl. 250—551 **9 Claims**



1. A method for optical fiber communication operating at gigabits per second comprising the steps of

generating periodic narrow pulses at a rate below said gigabit per second rate of communication by some multiple equal to or greater than N, where N is a selected integer,

dividing said narrow pulses into N channels, each of the channels 1 through N delaying the narrow pulse through it by an interval, τ, greater than the channel preceding it in the sequence 1 through N, and at each of the channels selectively inhibiting the narrow pulse according to the value of a respective binary digit in a group of N binary digits,

combining the delayed narrow pulses of said channels into a group of serial pulses in one channel,

driving a damped relaxation oscillation semiconductor laser with a bias current 10 to 20 percent above threshold laser current with said group of serial pulses to produce a train of optical pulses for transmission,

transmitting said train of optical pulses over an optical fiber to a receiver, and

detecting said train of optical pulses at said receiver.

4,427,896

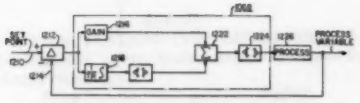
SYSTEM AND METHOD FOR OPERATING A STEAM TURBINE WITH CAPABILITY FOR BUMPLESSLY CHANGING THE SYSTEM CONFIGURATION ON-LINE BY MEANS OF SYSTEM PARAMETER CHANGES

Gerald E. Waldron, Pittsburgh, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Continuation of Ser. No. 247,880, Apr. 26, 1972, abandoned. This application Jul. 6, 1973, Ser. No. 377,173

Int. Cl.[2] H02P 9/04

U.S. Cl. 290—40 R **11 Claims**



1. A system for operating an electric power generating plant comprising a steam turbine, means including a steam generating system for supplying steam to said turbine, a generator driven by said turbine and adapted to generate a predetermined electrical load for network operation with other generators, said turbine including a plurality of turbine sections, a predetermined throttle valve arrangement, a predetermined governor valve arrangement, said throttle and governor valves disposed to control the flow of steam between said steam generating system and said turbine, a control system including an automatic control having means for controlling said governor and throttle valves to control the turbine speed in accordance with input speed and speed change rate demands, said speed controlling means including control elements and associated logic elements characterized with other registered system parameters, said automatic control system further including means for controlling said governor and throttle valves to control the turbine load in accordance with input load and load change rate demands, said load controlling means including control and associated logic elements characterized with other registered system parameters, said automatic control further including means for generating system protection signals in accordance with predetermined input variable signals and in accordance with other registered parameters, a control panel having means for selectively generating parameter value signals to change selectively the values of said other parameters, means for switchably coupling the parameter value signals to said automatic control and for registering the parameter value signals in said automatic control in place of the selected ones of said other parameters so as to restructure said automatic control to function in accordance with the selected ones of said other parameters, a manual backup control for said governor and throttle valves, means for transferring the operation of said control system from said automatic control to said manual backup control when said generating and coupling means are operated to register parameter changes, and means for disabling said generating and coupling means from registering parameter changes in said automatic control unless transfer has occurred to said manual backup control.

4,427,897

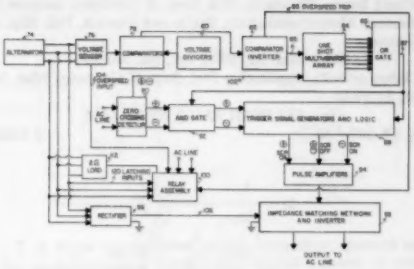
FIXED PITCH WIND TURBINE SYSTEM UTILIZING AERODYNAMIC STALL

Albert Migliori, Santa Fe, N. Mex., assignor to John Midyette, III, Santa Fe and John Humphrey, Tesuque, both of, N. Mex.

Filed Jan. 18, 1982, Ser. No. 339,836

Int. Cl.[3] F03D 7/02

U.S. Cl. 290—44 **16 Claims**



1. A fixed-pitch wind turbine system comprising:

a fixed-pitch wind turbine;

an alternator coupled to said fixed-pitch wind turbine, said alternator having an armature which produces an output voltage substantially proportional to the speed of rotation of said fixed-pitch wind turbine;

means for regulating said output voltage of said armature to control said speed of rotation of said fixed-pitch wind turbine to optimize power delivered by said alternator and induce aerodynamic stall in said fixed-pitch wind turbine whenever said optimized output power exceeds a predetermined maximum.

4,427,898

MOBILE POWER STATION APPARATUS

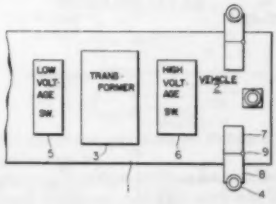
Yoshikazu Miyake, Itami, and Kenichi Ootsuka, Amagasaki, both of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Japan

Filed Dec. 6, 1982, Ser. No. 447,160

Claims priority, application Japan, Dec. 22, 1981, 56-192286[U]; Dec. 23, 1981, 56-192022

Int. Cl.[3] H02J 3/00

U.S. Cl. 307—9 **4 Claims**



1. A mobile power station apparatus comprising:

a plurality of lightning arresters disposed adjacent to one another together with equipment on a vehicle body, said lightning arresters being disposed in a transportation position within predetermined length and width dimensions of the vehicle body; and

rotary means provided on said respective lightning arresters including a support for each said lightning arrester rotatably mounted on said vehicle body for lateral turning movement to allow the respective lightning arrester to be moved from said transportation position to an operating

position extending beyond said dimensions of the vehicle body for adjusting the interphase gap between the ends of adjacent lightning arresters.

4,427,899

CIRCUIT ARRANGEMENT FOR SECURING THE SUPPLY VOLTAGE SUPPLY OF AN ELECTRONIC LOAD

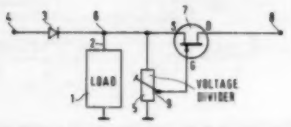
Hartmut Bruns, Bürnhorn, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Mar. 31, 1982, Ser. No. 363,935

Claims priority, application Fed. Rep. of Germany, Mar. 31, 1981, 3113523

Int. Cl.³ H01H *83/12*; H02H *3/24*

U.S. Cl. 307—66 **1 Claim**



1. A circuit for assuring the supply of voltage to an electronic load, comprising:

a first terminal for making connection to a main voltage supply;

a load coupled to the first terminal via a rectifier;

a second terminal for making connection to an auxiliary voltage supply;

a self-conducting field-effect transistor having a gate electrode, a source electrode, and a drain electrode, the source electrode coupled to the load and to the rectifier, the drain electrode coupled to the second terminal; and

a voltage divider connected in shunt to the load, the voltage divider having a tap which is directly connected to the gate electrode.

4,427,900

SUPPLY CIRCUIT FOR ELECTRONIC APPARATUS AT A HIGH ELECTRIC POTENTIAL

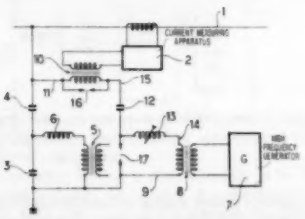
Pierre Aumont, and Jean-Pierre Dupraz, both of Aix les Bains, France, assignors to Alsthom-Atlantique, Paris, France

Filed Mar. 26, 1982, Ser. No. 362,325

Claims priority, application France, Mar. 30, 1981, 81 06337

Int. Cl.³ H02J *13/00*

U.S. Cl. 307—149 **7 Claims**



1. A power supply circuit for electronic apparatus at a high electric potential relative to the ground, said power supply circuit comprising:

a generator at ground potential and comprising means for delivering power for said electronic apparatus in the form of a high-frequency signal at an operating frequency;

a first lightly insulated transformer having a primary winding connected to output terminals of the generator and a secondary winding having one end connected to a low potential relative to the ground;

a second lightly insulated transformer having a secondary winding connected to the power supply input of said electronic apparatus and a primary winding having one end connected to said high potential;

and

a coupler circuit coupling the secondary winding of the first transformer to the primary winding of the second transformer at said operating frequency of said generator, said coupling circuit having two capacitors interconnecting respective pairs of the end of said coupled windings, thereby providing galvanic isolation therebetween while transmitting power at said operating frequency.

4,427,901

WAVEFORM SHAPING CIRCUIT

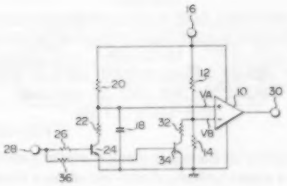
Yasuta Tomuro, Kawanishi, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 27, 1981, Ser. No. 315,648

Claims priority, application Japan, Nov. 8, 1980, 55-158372

Int. Cl.³ H03K *3/017, 3/02*

U.S. Cl. 307—268 **2 Claims**



1. A waveform shaping circuit comprising a voltage comparator having a pair of inputs, one of said inputs being supplied with a reference voltage, the other of said inputs being supplied with a voltage across a capacitor which is charged in the absence of a square input pulse and which is discharged in the presence of said square input pulse so as to thereby produce a square output pulse from said voltage comparator, and further comprising a means which is responsive to said square input pulse to vary said reference voltage.

4,427,902

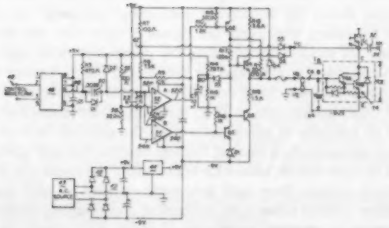
OPTIMUM TRANSISTOR DRIVE CIRCUIT WITH OVER LOAD COMPENSATION

Mark Hickman, Westboro, Mass., and Michael M. Brown, Kingston, N.H., assignors to Vee Arc Corporation, Westboro, Mass.

Filed Mar. 17, 1982, Ser. No. 359,037

Int. Cl.³ H03K *3/26, 23/22*

U.S. Cl. 307—270 **11 Claims**



1. A circuit for driving a biased power transistor high voltages and that has an input electrode and a pair of output elec-

trodes comprising emitter and collector electrodes, said circuit comprising;

input circuit means for receiving an input control signal said power transistor,

control transistor means coupled from said input circuit means having drive and non-drive states and having its output coupled to the input electrode of said power transistor,

first means, responsive to the magnitude of the power transistor collector-to-emitter voltage exceeding a predetermined threshold, for decreasing drive current from the control transistor means to the power transistor,

second means, responsive to the magnitude of the power transistor base-to-emitter voltage exceeding a predetermined threshold under overload conditions, for decreasing drive current from the control transistor means to the power transistor,

and third means, responsive to the magnitude of the power transistor collector-to-emitter voltage being below a predetermined reference level, for decreasing drive current to the power transistor for maintaining the power transistor in a non-saturated condition.

4,427,903
VOLTAGE CURRENT CONVERTER CIRCUIT

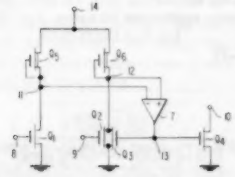
Masunori Sugimoto, Tokyo, Japan, assignor to Nippon Electric Co., Ltd., Tokyo, Japan

Filed Jun. 24, 1981, Ser. No. 276,742

Claims priority, application Japan, Jun. 24, 1980, 55-85367; May 14, 1981, 56-72516

Int. Cl.³ H03K *5/24*; H03F *3/45*

U.S. Cl. 307—355 **8 Claims**



8. A transistor circuit comprising first, second and third field effect transistors, each of said transistors having a source-drain current path and a gate for controlling the amount of current of said source-drain current path thereof, first and second voltage terminals, means for connecting the source-drain current path of said first transistor between said first and second voltage terminals, means for connecting the source-drain current paths of said second and third transistors in parallel between said first and second voltage terminals, means for supplying the gate of said first transistor with a control signal for controlling the amount of current flowing through the source-drain current path thereof, means for supplying the gate of said second transistor with a control signal for controlling the amount of current flowing through the source-drain current path thereof, first means for detecting value of current flowing through the source-drain current path of said first transistor, second means for detecting value of current flowing through the source-drain current path of said second transistor, and means responsive to outputs of said first means and said second means for controlling current flowing through the source-drain current path of said third transistor so as to make the sum of current values flowing through said second and third transistors close to the current value flowing through said first transistor.

4,427,904
DIGITAL SIGNAL GENERATING CIRCUIT

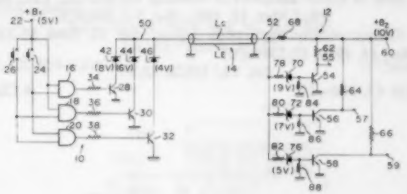
Kazuyoshi Imazeki, and Toshiyuki Tanaka, both of Tokyo, Japan, assignors to General Research of Electronics, Inc., Tokyo, Japan

Filed Jul. 31, 1981, Ser. No. 288,972

Claims priority, application Japan, Oct. 21, 1980, 55-147075

Int. Cl.³ H03K *13/00, 19/08, 19/092*

U.S. Cl. 307—463 **9 Claims**



7. A signal transmission circuit comprising: control means for establishing a predetermined plural number of control signals; encoding means for selectively providing a plurality of voltage levels, each corresponding to one of said control signals; single conductor means for receiving and transmitting said plurality of voltage levels; and decoding means coupled with said single conductor for generating a corresponding digital signal in response to each of said voltage levels; whereby each said digital signal corresponds to one of said control signals.

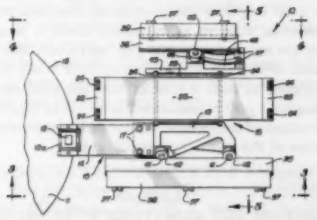
4,427,905
COMBINED LINEAR MOTOR AND SIDE MOUNTED OUTBOARD CARRIAGE

David A. Sutton, Santa Ynez, Calif., assignor to DMA Sytems Corporation, Goleta, Calif.

Continuation of Ser. No. 321,388, Nov. 16, 1981, abandoned. This application Jun. 16, 1983, Ser. No. 504,082

Int. Cl.³ H02K *41/02*

U.S. Cl. 310—13 **13 Claims**



1. A linear motor and side mounted outboard carriage combination comprising:

an elongate magnetic core having a longitudinal motion axis;

an armature associated with said core and being movable along said axis;

plural carriage ways secured on opposite sides of said core; and

a carriage assembly mounted on said ways and connected to said armature for movement therewith along said axis, said carriage assembly comprising:

a first carriage portion positioned on one side of said core;

a second carriage portion positioned on an opposite side of said core; and

a magnetic head assembly connected to said first carriage portion and positioned on said one side of said core, the mass of said second carriage portion being approxi-

mately equal to the combined mass of said first carriage portion and said magnetic head assembly whereby the center of gravity of said first and second carriage portions of said magnetic head assembly is approximately aligned with the center of force of said core.

4,427,906

VIBRATING COMPRESSOR

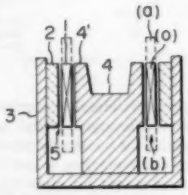
Hiroyuki Kainuma, Kumagaya, and Tadayoshi Kimura, Nitta, both of Japan, assignors to Sawafuji Electric Co., Ltd., Japan

Filed Mar. 11, 1981, Ser. No. 242,427

Claims priority, application Japan, Mar. 13, 1980, 55-31926; Mar. 13, 1980, 55-32856[U]

Int. Cl.³ H02K *33/18*

U.S. Cl. 310—27 **4 Claims**



1. A vibrating compressor having a cup-shaped external iron core; a plurality of permanent magnets formed into arc-shaped pieces the center angle of which includes 360° and disposed along the internal circumference of the external iron core; an internal iron core having a cylindrical magnetic pole 4' facing said permanent magnets at a predetermined gap and forming a magnetic path, together with the external iron core wherein an electromagnetic coil vibratably supported by a mechanical vibration system is disposed in an annular magnetic gap formed by a space defined by the permanent magnets and the cylindrical magnetic pole of the internal iron core, and an alternating current is fed to the electromagnetic coil to drive a piston connected to the electromagnetic coil, said permanent magnets being made of ferrite magnets, the ferrite magnets being formed in such a fashion that the axial length thereof is longer than the axial length of the cylindrical magnetic pole formed on the internal core so as to ensure uniform magnetic flux density in the annular magnetic gap, said electromagnetic coil, in the state where the alternating current is not fed thereto, being disposed in such a manner that the axial center of the electromagnetic coil is positioned at an offset location at least in the direction of compression of the piston with respect to the axial center of the annular magnetic gap.

4,427,907

SPIRAL PANCAKE ARMATURE WINDING MODULE FOR A DYNAMOELECTRIC MACHINE

Carl Flick, and Richard D. Nathenson, both of Pittsburgh, Pa., assignors to Electric Power Research Institute, Inc., Palo Alto, Calif.

Filed Nov. 23, 1981, Ser. No. 324,295

Int. Cl.³ H02K *9/19*

U.S. Cl. 310—52 **6 Claims**

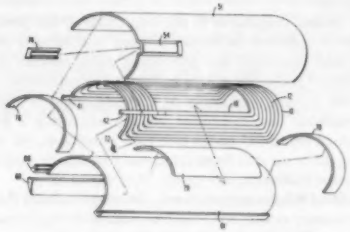
1. A stator phase coil for a superconducting dynamoelectric machine, comprising:

a phase coil, said phase coil comprising a conductor formed into a plurality of concentric turns, said turns defining a curved shape wth first and second spirally arcuate surfaces;

an inner electrically insulative skin, said inner skin being generally rigid and disposed proximate said first arcuate surface of said phase coil;

an outer electrically insulative skin, said outer skin being generally rigid and disposed proximate said second arcuate surface of said phase coil;

means for electrically insulating the outer edges of said phase coil, said insulating means being disposed between said inner and outer insulative skin, said insulating means being generally rigid;



means for preventing electrical communication between adjacent of said turns, said preventing means being disposed on the surface of said conductor; and

a nonmagnetic filler piece disposed between said inner and outer insulative skins and in the center of said phase coil.

4,427,908

ELECTRICAL MACHINE WITH COMPRESSED AIR COOLING

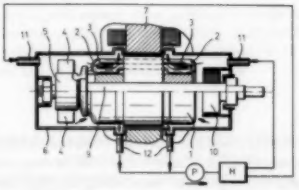
Geza Halmai, Budapest, Hungary, assignor to Villamosipari Kutato Intezet, Budapest, Hungary

Continuation of Ser. No. 61,314, Jul. 27, 1979, abandoned, which is a continuation of Ser. No. 870,254, Jan. 17, 1978, abandoned, which is a continuation of Ser. No. 680,969, Apr. 27, 1976, abandoned. This application Nov. 12, 1981, Ser. No. 320,687

Claims priority, application Hungary, Apr. 28, 1975, HA 985

Int. Cl.³ H02K *9/08*

U.S. Cl. 310—57 **1 Claim**



1. An electrical machine comprising:

an armature formed with an iron body having a crown around a periphery thereof and windings lying in said crown with heads disposed on opposite axial sides of said crown, each of said heads being formed with a winding loop defining an inner layer and an outer layer radially spaced from said inner layer;

respective tubular insets received in said heads and forming axially extending cooling channels therein;

a pressure-tight case enclosing said armature and having axially opposite portions to either side of said crown;

respective compressed air outlets connected to said case at said portions adjacent said crown;

respective compressed air inlets, opening into opposite ends of said case for a connection to compressed air, the outlets being connected to a heat exchanger;

magnet poles surrounding said case between said portions and juxtaposed with said crown to cooperate with said armature and develop electromotive forces rotating said armature;

a sealing at one end of said case, said armature having a shaft extending from said case through said sealing; and

means including said heat exchanger connected to said inlets and said outlets for circulating compressed air in a closed path through said case and the channels and in direct contact with said windings for cooling same.

4,427,909

PLACING STAND DRIVING DEVICE HAVING FLYWHEEL EFFECT IN ONLY ONE DIRECTION

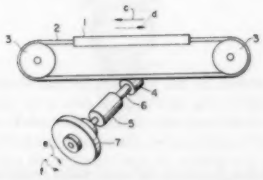
Toshikatsu Takahashi, Kanagawa, Japan, assignor to Fuji Xerox Co., Ltd., Tokyo, Japan

Filed Mar. 23, 1982, Ser. No. 361,027

Claims priority, application Japan, Mar. 24, 1981, 56-42745

Int. Cl.³ H02K *7/02*; G03G *15/28*

U.S. Cl. 310—74 **8 Claims**



1. A placing stand driving device comprising:

a step motor having an output shaft;

torque transmitting means for translating rotary movement of said output shaft in both clockwise and counterclockwise directions to linear movement of said placing stand in respective opposed directions;

a flywheel; and

directional coupling means for coupling said flywheel to said output shaft for and only for rotary movement of said output shaft in a predetermined one of said clockwise and counterclockwise directions.

4,427,910

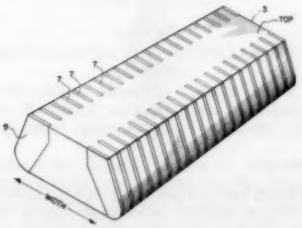
MAGNETIC SLOT WEDGE WITH LOW AVERAGE PERMEABILITY AND HIGH MECHANICAL STRENGTH

Eike Richter, and Henry G. Lenz, both of Scotia, N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Mar. 1, 1982, Ser. No. 353,278

Int. Cl.³ H02K *3/48*

U.S. Cl. 310—214 **2 Claims**



1. A slot wedge for use in a toothed stator of a rotary electric machine, successive teeth of said stator forming slots therebetween, said slot wedge comprising:

a nonmagnetic body having a width corresponding to the width of any of said slots, said nonmagnetic body having a plurality of parallel slits extending part way through the width of said body from both sides, said slits extending perpendicular to the top surface of said nonmagnetic body; and

a plurality of magnetic laminations, one lamination positioned in each of said slits, respectively.

4,427,911

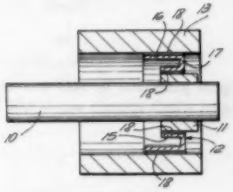
ROTOR FOR A STEPPER MOTOR HAVING A SHEET METAL SUPPORT FOR THE MAGNET

Harry G. Manson, Princeton, Ind., assignor to IMC Magnetics Corp., Jericho, N.Y.

Filed Jan. 4, 1982, Ser. No. 336,541

Int. Cl.³ H02K *21/12*

U.S. Cl. 310—261 **3 Claims**



1. A rotor for a stepper motor, comprising:

(a) an annular hub having a central opening adapted to accommodate a motor shaft,

(b) a tubular permanent magnet having an internal diameter larger than the external diameter of the hub, the magnet being located around the hub to define an annular space between the hub and the magnet,

(c) an annular support within said annular space, the support having a radially outer surface facing the interior surface of the magnet and the support having a radially inner surface facing the exterior surface of the hub, the support outer surface being spaced from the magnet interior surface and the support inner surface being spaced from the hub exterior surface, and the support being a tubular element comprising an annular outer wall, an annular inner wall substantially concentric with the outer wall, and a bridge joining the corresponding ends of the two walls, the two walls and bridge comprising a single piece of thin sheet metal, and

(d) a bonding material filling the annular gaps between the radially outer and inner surfaces of the support, and the magnet and the hub, respectively.

4,427,912

ULTRASOUND TRANSDUCER FOR ENHANCING SIGNAL RECEPTION IN ULTRASOUND EQUIPMENT

Tuan S. Bui, Rydalmere, and John A. Sherlock, North Manly, both of Australia, assignors to Ausonics Pty. Ltd., Lane Cove, Australia

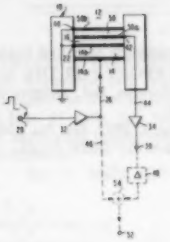
Filed May 13, 1982, Ser. No. 377,612

Int. Cl.³ H01L *41/04*

U.S. Cl. 310—322 **4 Claims**

1. An ultrasonic transducer assembly comprising a first layer of piezoelectric material, said first layer having electrode coatings on opposite faces thereof and being responsive to an electrical signal applied across said coatings for generating an ultrasound signal; a second layer of piezoelectric material acoustically coupled to said first layer for coupling ultrasound signals generated by said first layer to an interrogation medium, said second layer having electrode coatings on opposite faces thereof and being responsive to an ultrasound signal echo received from said interrogation medium following the generation of an ultrasound signal by said first layer for generating an electrical signal, said second layer being acoustically coupled to said first layer by an intermediate matching layer; and means

for enhancing the electrical signal generated by said second layer, said enhancing means including means for adding to the



electrical signal generated by said second layer an in-phase electrical signal which appears across said first layer.

4,427,913

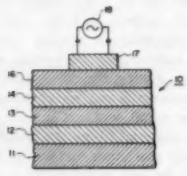
ACOUSTIC DIFFRACTOMETER

Gerald J. Iafrate, Toms River, and Arthur Ballato, Long Branch, both of N.J., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Continuation of Ser. No. 269,283, Jun. 1, 1981, abandoned. This application Mar. 30, 1983, Ser. No. 480,624

Int. Cl.³ H01L *41/08*

U.S. Cl. 310—334 **6 Claims**



1. An electrical multibandpass filter device used at frequencies above 300 GHZ comprising:

an acoustic diffractometer means which comprises a substrate of bulk gallium arsenide and at least two alternating layers of piezoelectrically active but electrically inactive GaAs material, and piezoelectrically inactive insulator with acoustic mismatch, GaAlAs material, respectively, on said substrate defining an acoustically mismatched superlattice the number and thicknesses of the alternating layers defining the frequency of the pass bands;

electrical input means to said filter device comprising acoustic wedges, angle cut to permit efficient transmission into the superlattice including means for transducing an input electrical signal for launching the input as an acoustical wave in said acoustic diffractometer means; and

electrical output means for said filter device comprising acoustic wedges on the opposite side of said device than the input wedges, and angle cut to permit efficient transmission out from the superlattice including means for transducing an output acoustical wave signal received from said acoustic diffractometer means into an output electrical signal.

4,427,914

SPARKPLUG WITH IMPROVED ANTIFOULING PERFORMANCE

Hisao Mizuno; Shunichi Takagi; Kichio Nakahara, and Hiroyuki Nagae, all of Aichi, Japan, assignors to NGK Spark Plug Co., Ltd., Aichi, Japan

Filed Jul. 20, 1981, Ser. No. 284,875

Claims priority, application Japan, Nov. 26, 1980, 55-166132

Int. Cl.³ H01T *13/02*

U.S. Cl. 313—130 **9 Claims**

1. A sparkplug having good antifouling properties wherein a porcelain insulator for supporting a central electrode is fixed in a metal casing, the improvement wherein a coating comprising fluorine oil containing elemental fluorine is provided on at least a firing surface except for a tip of said porcelain insulator surrounded by an inner surface of a combustion chamber side of said metal casing, thereby preventing a decrease in electrical resistance.

4,427,915

SPARK PLUG AND THE PROCESS FOR PRODUCTION THEREOF

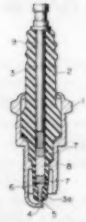
Kanemitsu Nishio; Shunichi Takagi, and Yasuhiko Suzuki, all of Nagoya, Japan, assignors to NGK Spark Plug Co. Ltd., Aichi, Japan

Filed Oct. 10, 1980, Ser. No. 195,734

Claims priority, application Japan, Oct. 13, 1979, 54-132139

Int. Cl.³ H01T *21/02, 1/16*

U.S. Cl. 313—141 **26 Claims**

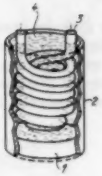


1. A spark plug having a spark electrode at a position thereof facing an external electrode wherein said spark electrode is prepared by mixing at least a titanium compound and a noble metal selected from a group consisting of Pt, a mixture of Pt and Pd, or a mixture of noble metals consisting of (a) a member selected from a group consisting of Pt and Pd and (b) at least one member selected from a group consisting of Au, Ru, Ag and Rh, forming the resulting mixture into the shape of a spark electrode, and then sintering the mixture, wherein the titanium compound is the major ceramic component of the spark electrode.

4,427,916
HEATING ELEMENT FOR INDIRECTLY HEATED CATHODE AND METHOD FOR THE MANUFACTURE OF SUCH AN ELEMENT

Arvind Shroff, Paris, France, assignor to Thomson-CSF, Paris, France

Filed Feb. 9, 1980, Ser. No. 232,571
Claims priority, application France, Feb. 15, 1980, 80 03410
Int. Cl.³ H01J *1/14, 17/06;* H01K *1/04*
U.S. Cl. 313—346 R **10 Claims**



1. An electrical heating element for an indirectly heated cathode formed by a disk made from an emissive material occupying one of the ends of a cylinder made from a non-emissive material, the heating element being formed by a filament positioned within the cylinder and by a thermally conductive and electrically non-conductive fritted mixture of alumina and oxide filling the space left free by the filament within the cylinder, wherein the mixture is formed by alumina and at least 10% by weight of an oxide of one of the elements of column IIIB of the periodic table of elements, said mixture being fritted at between 1700° and 1800° C., said filament having electrical terminal connections extending outside of said mixture.

8. A method for the manufacture of a heating element wherein it comprises the following stages:

(a) the powder of an oxide of one of the elements of column IIIB of the periodic table of elements and one or more alumina powders of different grain size distributions are intimately mixed accompanied by stirring, the oxide powder not exceeding 10% by weight of the mixture,

(b) a solvent is added to the mixture so as to obtain a paste,

(c) the surface of the emissive disk facing the inside of the cylinder made from non-emissive material is coated with said paste and the solvent is then slowly evaporated,

(d) the filament is introduced into the cylinder,

(e) the cylinder is filled several times with the paste, whose consistency can be modified by adding the solvent, whilst evaporating the solvent on each occasion,

(f) fritting takes place under hydrogen at between 1700° and 1800° C.

4,427,917
TELEVISION CAMERA TUBE WITH ELECTROSTATIC FOCUSING

Masashi Mizushima, Shizuoka; Shigeru Ehata, Mobara; Masanori Maruyama, and Masakazu Fukushima, both of Kokubunji, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

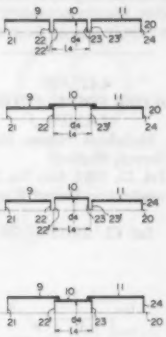
Continuation of Ser. No. 160,203, Jun. 17, 1980, abandoned.
This application Sep. 13, 1982, Ser. No. 416,916
Claims priority, application Japan, Jun. 22, 1979, 54-78210
Int. Cl.³ H01J *31/26, 29/74, 29/46*
U.S. Cl. 313—389 **12 Claims**

1. A television camera tube with electrostatic focusing in which an optical image is projected onto a photoconductive target to develop thereover the distribution of potential corresponding to the optical image and this photoconductive target is scanned by an electron beam to produce an electrical signal corresponding to the optical image, said television camera tube comprising:

an electron beam emitting section including cathode means and grid means for generating an electron beam;

said photoconductive target;

an electrostatic focusing lens including cylindrical electrode means disposed between said electron beam emitting section and said photoconductive target for focusing the electron beam from said electron beam emitting section onto said photoconductive target, said cylindrical electrode means having first, second and third cylindrical electrodes coaxially arranged in the mentioned order from the side of the said electron beam emitting section, means for applying to said first cylindrical electrode a first voltage greater than a third voltage which is applied to said third cylindrical electrode, means for applying to said second cylindrical electrode a second voltage smaller than said third voltage, said second cylindrical electrode satisfying the relation of $1.20 < l_4/d_4 \leqq 2.30$, l_4 and d_4 being the length and inner diameter of said second cylindrical electrode; and

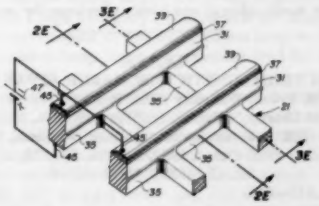


a collimation lens including mesh electrode means disposed between said electrostatic focusing lens and said photoconductive target for casting the focused electron beam from said electrostatic focusing lens perpendicularly onto said photoconductive target.

4,427,918
FOCUSING COLOR-SELECTION STRUCTURE FOR A CRT

Steven A. Lipp, Hopewell, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Jan. 26, 1981, Ser. No. 228,588
Int. Cl.³ H01J *29/80*
U.S. Cl. 313—402 **3 Claims**



1. In a color-selection structure for a cathode-ray tube, said color-selection structure being of the type comprising (a) a metal plate having two opposed major surfaces and having an array of apertures therethrough, said apertures being arranged in substantially parallel columns, (b) an array of elongated electrical conductors closely spaced from said plate, the

lengths of said conductors being substantially parallel to and interdigitated between said columns of apertures, and (c) connection means for applying a voltage between said plate and said array of conductors, the improvement wherein

(1) said plate has an array of substantially-parallel ridges of plate metal between said columns of apertures and integral with and upstanding from one of said major surfaces, the lengths of said ridges being substantially parallel to said columns of apertures, said ridges being at least as high as said plate is thick,

(2) an electrically-insulating layer over the tops of each of said ridges, and

(3) an electrically-conducting layer over each said electrically-insulating layer, thereby providing said array of electrical conductors closely spaced from said plate.

4,427,919

MERCURY HOLDER FOR ELECTRIC DISCHARGE LAMPS

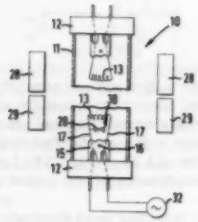
Julian P. Grenfell, Hollybank House, Hollybank Rd., Hook Heath, Woking, Surrey, England

Filed Jul. 23, 1981, Ser. No. 286,358

Claims priority, application United Kingdom, Jul. 30, 1980, 8024860

Int. Cl.³ H01J *61/28*

U.S. Cl. 313—546 **4 Claims**



1. An electric light source comprising a sealed transparent elongated envelope containing a fill gas, a cathode at each end of said elongated envelope, lead-in conductors connected to each said cathode and connectable to an external source of electric current, a holder containing a predetermined volume of mercury mounted within the envelope at one end thereof and being anodically connected relative to the cathodes by being connected to one of the lead-in conductors of one of the cathodes, the other cathode being connected in an electrical circuit effective on energisation to cause said other cathode to emit electrons towards the anodically functioning holder and to generate ions by collisions with gas molecules in the envelope, whereby the said holder heats up under the electronic and ionic bombardment and bursts to release the mercury.

4,427,920

ELECTROMAGNETIC DISCHARGE APPARATUS

Joseph M. Proud, Wellesley Hills; Robert K. Smith, Wilmington, and Charles N. Fallier, Jr., Westford, all of Mass., assignors to GTE Laboratories Incorporated, Waltham, Mass.

Filed Oct. 1, 1981, Ser. No. 307,418

Int. Cl.³ H05B *41/16, 41/24*

U.S. Cl. 315—248 **11 Claims**

1. Electromagnetic discharge apparatus comprising

an electrodeless lamp having an envelope of a light transmitting substance, the envelope having opposite first and second outer surfaces;

a fill material within the envelope capable of emitting light upon breakdown and excitation when subjected to a high frequency electric field;

an inner conductor;

an outer conductor disposed around the inner conductor;

the conductors having means at one end adapted for coupling to a high frequency power source;

a first electrode connected to the other end of said inner conductor and having a surface adjacent to said first outer surface of the envelope of the electrodeless lamp; and

a second electrode connected to the other end of said outer conductor and having a surface adjacent to said second outer surface of the envelope of the electrodeless lamp;

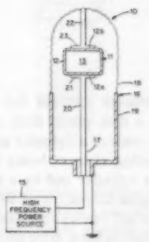
wherein

the electrodeless lamp is centered on the central axis of the apparatus;

said outer conductor includes conductive mesh encircling said electrodeless lamp and spaced therefrom;

said inner conductor extends along said central axis;

said first electrode extends along said central axis from said inner conductor and terminates in a first electrode member generally transverse to said central axis and having a surface area contiguous with a major portion of said first outer surface of the envelope of the electrodeless lamp;



said second electrode extends along said central axis from said conductive mesh and terminates in a second electrode member generally transverse to said central axis and having a surface area contiguous with a major portion of said second outer surface of the envelope of the electrodeless lamp; and

said first and second electrode members are disposed generally parallel to each other and are closely spaced to provide a high value of electric field to pressure ratio within the fill material

whereby when high frequency power is applied to said inner and outer conductors, a high frequency electric field is produced between the first and second electrodes causing breakdown and excitation of the fill material within the envelope.

4,427,921

ELECTRODELESS ULTRAVIOLET LIGHT SOURCE

Joseph M. Proud, Wellesley Hills, and Stephen G. Johnson, Georgetown, both of Mass., assignors to GTE Laboratories Inc., Waltham, Mass. and GTE Products Corp., Stamford, Conn.

Filed Oct. 1, 1981, Ser. No. 307,419

Int. Cl.³ H05B *41/16, 41/24*

U.S. Cl. 315—248 **18 Claims**

1. An electromagnetic discharge apparatus comprising

an electrodeless lamp having an envelope of a substance transparent to ultraviolet radiation;

a fill material within said envelope consisting essentially of a metal iodide and an inert buffer gas; and

means for coupling high frequency power to the fill material within the envelope

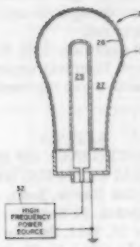
whereby when high frequency power is applied, the fill material within the envelope is vaporized and excited producing ultraviolet radiation.

11. An electromagnetic discharge apparatus comprising

an electrodeless lamp having an envelope of a substance transparent to ultraviolet radiation enclosing a fill material; and

means for coupling high frequency power to the fill material within the envelope;

the fill material being selected from the group consisting of a source of iodine atoms which are excited to a high energy state when high frequency power is applied and



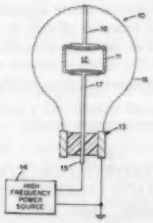
which emit ultrviolet radiation by photon emission transition to a lower energy state together with an inert buffer gas, and a source of iodine atoms which are excited to a high energy state when high frequency power is applied and which emit ultraviolet radiation by photon emission transition to a lower energy state.

4,427,922

ELECTRODELESS LIGHT SOURCE

Joseph M. Proud, Wellesley Hills, and Stephen G. Johnson, Georgetown, both of Mass., assignors to GTE Laboratories Inc., Waltham, Mass. and GTE Products Corp., Stamford, Conn.

Filed Oct. 1, 1981, Ser. No. 307,420
Int. Cl.³ H05B 41/16, 41/24
U.S. Cl. 315—248 **13 Claims**



1. An electromagnetic discharge apparatus comprising

an electrodeless lamp having an envelope of a substance transparent to visible light;

a fill material within said envelope consisting essentially of a material selected from the group consisting of mercuric iodide, mercuric bromide, mercuric chloride, and mixtures thereof; and an inert buffer gas; and

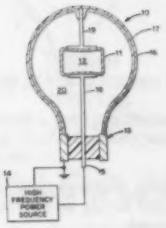
means for coupling high frequency power to the fill material within the envelope to vaporize and excite the fill material producing visible light.

4,427,923

ELECTRODELESS FLUORESCENT LIGHT SOURCE

Joseph M. Proud, Wellesley Hills, and Stephen G. Johnson, Georgetown, both of Mass., assignors to GTE Laboratories Inc., Waltham, Mass. and GTE Products Corp., Stamford, Conn.

Filed Oct. 1, 1981, Ser. No. 307,556
Int. Cl.³ H05B 41/16, 41/24
U.S. Cl. 315—248 **23 Claims**



1. An electromagnetic discharge apparaus comprising

an electrodeless lamp having an inner envelope of a substance transparent to ultraviolet radiation enclosing a fill material selected from the group consisting of a metal iodide together with an inert buffer gas and iodine;

means for coupling high frequency power to the fill material within the inner envelope to vaporize and excite the fill material producing ultraviolet radiation;

an outer envelope of a substance transparent to visible light surrounding said inner envelope and spaced therefrom; and

fluorescing material which emits visible light upon absorption of ultraviolet radiation disposed between the outer surface of the inner envelope and the inner surface of the outer envelope.

14. An electromagnetic discharge apparatus comprising

an electrodeless lamp having an inner envelope of a substance transparent to ultraviolet radiation enclosing a fill material;

an outer envelope of a substance transparent to visible light surrounding said inner envelope and spaced therefrom;

a coupling fixture having an inner conductor and an outer conductor encircling the inner conductor;

the conductors having means at one end adapted for coupling to a high frequency power source and means at the other end coupled to said electrodeless lamp so that said electrodeless lamp forms a termination load for the coupling fixture;

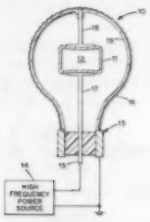
the fill material being selected from the group consisting of a source of iodine atoms which are excited to a high energy state when high frequency power is applied to said coupling fixture and which emit ultraviolet radiation by photon emission transition to a lower energy state together with an inert buffer gas, and a source of iodine atoms which are excited to a high energy state when high frequency power is applied and which emit ultraviolet radiation by photon emission transition to a lower energy state; and

fluorescing material which emits visible light upon absorption of ultraviolet radiation disposed between the outer surface of said inner envelope and the inner surface of said outer envelope.

4,427,924
ENHANCED ELECTRODELESS LIGHT SOURCE

Joseph M. Proud, Wellesley Hills; Walter P. Lapatovich, Watertown, and Stephen G. Johnson, Georgetown, all of Mass., assignors to GTE Laboratories Inc., Waltham, Mass. and GTE Products Corp., Stamford, Conn.

Filed Oct. 1, 1981, Ser. No. 307,568
Int. Cl.³ H05B 41/16, 41/24
U.S. Cl. 315—248 4 Claims

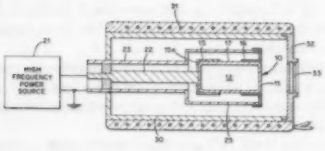


1. An electromagnetic discharge apparatus comprising
an electrodeless lamp having an envelope made of a light transmitting material;
a fill material within said envelope consisting essentially of a mixture of a mercury halide, iodine, and nitrogen; and
means for coupling high frequency power to the fill material within the envelope to vaporize and excite the fill material whereby the fill material emits light.

4,427,925
ELECTROMAGNETIC DISCHARGE APPARATUS

Joseph M. Proud, Wellesley Hills; Robert K. Smith, Wilmington, and Charles N. Fallier, Jr., Westford, all of Mass., assignors to GTE Laboratories Incorporated, Waltham, Mass.

Filed Nov. 18, 1981, Ser. No. 322,491
Int. Cl.³ H05B 41/16, 41/24
U.S. Cl. 315—248 5 Claims

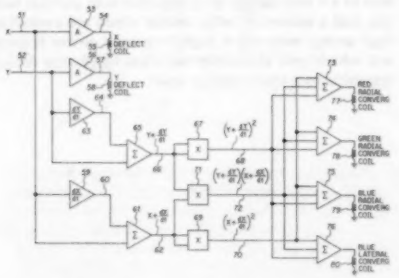


1. Electromagnetic discharge apparatus comprising
an electrodeless lamp having an envelope of a light transmitting substance;
a fill material within the envelope capable of emitting light upon breakdown and excitation when subjected to a high frequency electric field;
a first electrode of conductive material encircling said envelope adjacent to one end thereof;
a second electrode of conductive material encircling said envelope adjacent to the opposite end thereof;
said first and second electrodes being spaced apart in the region between the ends of the envelope to provide a capacitive gap therebetween; and
power supply and transmission means for producing potential differences at high frequency between said first and second electrodes
whereby high frequency energy is coupled across said capacitive gap between said first and second electrodes subjecting the fill material adjacent to said region to high frequency energy causing breakdown and excitation of the fill material within the envelope; wherein
the envelope of said electrodeless lamp is generally cylindrical having an end wall at said one end and an end wall at said opposite end;
said first electrode closely encircles a first portion of the cylindrical envelope adjacent to said one end;
said second electrode closely encircles a second portion of the cylindrical envelope adjacent to said opposite end and permits the passage of light emitted by the fill material within the envelope through the end wall at said opposite end of the envelope; and
said first and second electrodes have first and second edges, respectively, spaced from and opposed to each other to provide said capacitive gap therebetween.

4,427,926
DYNAMIC CONVERGENCE OF RANDOM SCAN MULTI-BEAM CATHODE RAY TUBES

Lyle R. Strathman, Cedar Rapids, Iowa, assignor to Rockwell International Corporation, El Segundo, Calif.

Filed May 18, 1981, Ser. No. 264,753
Int. Cl.³ H01J 29/70, 29/76
U.S. Cl. 315—368 12 Claims



1. In a plural beam cathode ray tube beam deflection system comprising a deflection force field generating means to which respective horizontal and vertical beam scan signals X and Y are applied, plural beam convergence signal responsive means, means for developing a convergence signal for application to said convergence signal responsive means, said convergence signal being a predetermined function of said X and Y scan signals;
means for predistorting each of said X and Y scan signals by summation thereof with the rate of change thereof prior to application to said convergence signal developing means, said predetermined function of said X and Y scan signals being implemented as the same predetermined function of (X+dX/dt) and (Y+dY/dt), where dX/dt and dY/dt represent the respective time rates of change of said X and Y scan signals.

4,427,927
APPARATUS FOR CONTROLLING ELECTRON BEAM OF IMAGE PICKUP TUBE

Takashi Nakamura, Hadano, Japan, assignor to Sony Corporation, Tokyo, Japan

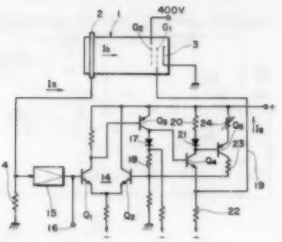
Filed Jun. 16, 1981, Ser. No. 274,171
Claims priority, application Japan, Jun. 17, 1980, 55-82305
Int. Cl.³ H01J 29/52
U.S. Cl. 315—383 8 Claims

1. In combination with an image pick-up tube including a diode-type electron gun having a cathode electrode for emitting a scanning electron beam and a control electrode for regulating the current of said beam at said cathode electrode and through which there is a control electrode current flow during operation of the tube, and a target electrode from which a video output signal is obtained in correspondence to incident light from an object image projected on said target electrode as

the latter is scanned by said electron beam; a circuit for controlling said electron beam comprising:

nonlinear means for generating a beam control signal in response to said video output signal and having a nonlinear transfer characteristic,

means for applying said beam control signal to said control



electrode for correspondingly regulating said current of the beam at said cathode electrode,

means for detecting said control electrode current flow during operation of the tube, and

means for feeding back, to said means for generating the beam control signal, a signal which corresponds to the detected control electrode current flow.

4,427,928

BRAKING CONTROL APPARATUS FOR AN ELECTRIC MOTOR OPERATED VEHICLE

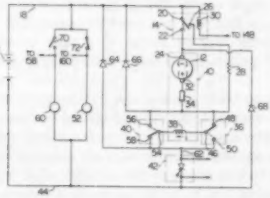
Shigeru Kuriyama, Katsuta; Kiyosi Nemoto, Naka, and Michimasa Horiuchi, Katsuta, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Apr. 30, 1981, Ser. No. 259,161

Claims priority, application Japan, May 6, 1980, 55-58721

Int. Cl.³ H02P *3/12, 7/00*

U.S. Cl. 318—139 **2 Claims**



1. A braking control apparatus for an electric motor operated vehicle including a DC motor for operating the vehicle, contactor means for effecting change-over between forward and backward modes of operation of the vehicle and a chopper circuit having a duty cycle varying in response to an accelerator so as to control the speed of the vehicle, said apparatus comprising forward/backward change-over detecting means for detecting a change-over from said forward mode of operation to said backward mode of operation or vice versa, and regenerative braking activating means for effecting regenerative braking when said forward/backward change-over detecting means detects said change-over from said forward to said backward mode of operation or vice versa, said forward-/backward change-over detecting means and said regenerative braking activating means including: first means for detecting the duty cycle of said chopper circuit; second means for detecting whether a level detected by said first means is higher or lower than a predetermined level; third means for detecting whether an output of said accelerator is greater than a predetermined value; fourth means for detecting the operation of forward/backward switch means so as to generate a clock signal; and fifth means for detecting that there is no output from said second means and that the value detected by said third means is greater than said predetermined value and responsive to said clock signal from said fourth means to energize contactor excitation coil means.

4,427,929

WINDOW AND DOOR LOCKING SYSTEM FOR VEHICLES

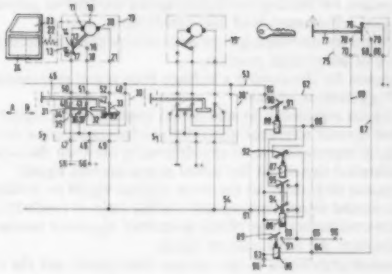
Marcel Andrei-Alexandru, and Hans Prohaska, both of Bietigheim-Bissingen, Fed. Rep. of Germany, assignors to ITT Industries, Inc., New York, N.Y.

Filed Apr. 16, 1982, Ser. No. 369,261

Claims priority, application Fed. Rep. of Germany, Apr. 28, 1981, 3116691

Int. Cl.³ F05B *47/00*

U.S. Cl. 318—282 **4 Claims**



1. A control circuit for synchronizing the operation of a combined manual and motor-driven door locking mechanism system having a plurality of reversible motors each of which are respectively assigned to a door and its manual door locking element, said control circuit comprising:

a plurality of position switches (19) respectively coupled to each of said motors, each of said switches having a movable contact (12,14) which is actuated by its associated motor (10) from a first switch position (16) corresponding to the end position of said motor in a first rotational direction to a second switch position (15) corresponding to the end position of said motor (10) in the opposite rotational direction;

an operating switch (75) for simultaneously applying a voltage source to said motors;

means for electrically sensing the positions (15,16) of said movable contact (12,14) of said position switches (19);

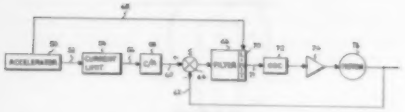
first means responsive to said operating switch and said sensing means for selectively activating all of said motors having their respective movable contacts (12,14) in said first switch position (16) until their respective movable contacts (12,14) are moved into said second switch position (15); and,

means responsive to said first means for activating all of said motors to move their respective movable contacts (12,14) from said second switch position (15) to said first switch position (16).

4,427,930
ELECTRIC VEHICLE CURRENT REGULATOR

Max Berman, Charlottesville; William G. Klimmek, Earlysville, and Charles E. Konrad, Roanoke, all of Va., assignors to General Electric Company, Salem, Va.

Filed Dec. 23, 1981, Ser. No. 333,931
Int. Cl.³ H02K 27/20
U.S. Cl. 318—301 **3 Claims**
MICROFICHE APPENDIX INCLUDED
(1 Microfiche, 39 Pages)



1. In combination with apparatus for regulating the torque developed by a direct current electric traction motor in an electric powered vehicle, the apparatus being of the type wherein power to the motor is controlled by a time-ratio switching regulator alternately conductive and non-conductive to connect and disconnect the motor to a source of direct current power and wherein the switching regulator is controlled by gating signals supplied at varying time intervals to adjust the ratio of conducting to non-conducting time in response to an accelerator position signal produced by an accelerator on the vehicle, the improvement comprising:

(a) means for sensing the actual motor current to provide a signal representative of said actual motor current;

(b) means for developing a current reference signal representative of accelerator position;

(c) means for developing a voltage limit signal representative of accelerator position;

(d) means responsive to said actual motor current signal and said current reference signal for producing an error current signal representative of any difference between the current reference signal and the actual motor current signal;

(e) means responsive to the error current signal to produce a command signal representative of the ratio of conducting to non-conducting time of the switching regulator tending to minimize the error current signal;

(f) means responsive to the voltage limit signal and the command signal for limiting the command signal to a corresponding time ratio value not exceeding the time ratio value corresponding to the voltage limit signal; and,

(g) means for applying the value limited command signal to control the conduction time of the switching regulator.

4,427,931
SPEED CONTROL APPARATUS FOR DIRECT CURRENT MOTOR

Akira Tsukihashi, Oora, Japan, assignor to Sanyo Electric Co., Ltd., Moriguchi and Tokyo Sanyo Electric Co., Ltd., Gunma, both of, Japan

Filed Oct. 9, 1981, Ser. No. 310,066
Claims priority, application Japan, Oct. 17, 1980, 55-146044; Oct. 22, 1980, 55-148480
Int. Cl.³ H02P 5/06
U.S. Cl. 318—317 **9 Claims**

1. A speed control apparatus for a direct current motor, comprising:

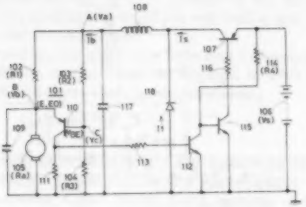
first and second terminals adapted to receive a dc current;

bridge circuit means including four arms, three of said arms comprising resistive means and the remaining arm comprising an armature of said motor, said bridge circuit further including unbalanced voltage detecting points;

unbalanced voltage detecting means responsive to a voltage appearing at said unbalanced voltage detecting points for detecting the unbalanced voltage of said bridge circuit means;

switching means coupled between said direct current voltage source means and said bridge circuit means for conducting or interrupting a supply of said dc current received from said first and second terminals;

control means responsive to said unbalanced voltage detecting means for turning said switching means to an on-state or an off-state;



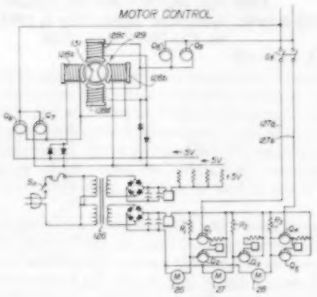
inductor means coupled between said switching means and said bridge circuit means; and

induced electromotive force supply means coupled to said bridge circuit for supplying thereto and induced electromotive force developed in said inductor means when said switching means is brought to an off-state.

4,427,932
DIGITALLY CONTROLLED DRAFTING MACHINE

Bennie Chappell, 1260 Madera, Menlo Park, Calif. 94025

Filed Mar. 22, 1982, Ser. No. 360,218
Int. Cl.³ H02P 7/06
U.S. Cl. 318—574 **15 Claims**

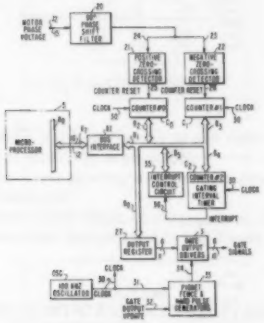


1. A drafting machine comprising a board on X-axis track mounted on said board, a Y-axis mount reciprocable along said X-axis track, a Y-axis track fixed to said Y-axis mount, a carrier reciprocable along said Y-axis track, a pencil on said carrier adapted to mark a paper on said board, a first variable speed motor, a second fixed speed motor having a maximum speed less than the maximum speed of said first motor, a third variable speed motor having the range of speeds equal to that of said first motor, first drive means responsive in speed and direction to the difference in speed between said first and second motors, second drive means responsive in speed and direction to the difference in speed between said second and third motors, electrical means for driving said first and third motors at individual variable speeds and said second motor continuously, third drive means for moving said Y-axis mount along said X-axis track responsive to relative movement of said first and second drive means and fourth drive means for moving said carrier along said Y-axis track responsive to said relative movement of said first and second drive means.

4,427,933
LOAD COMMUTATED INVERTER GATING CONTROL SYSTEM AND MOTOR DRIVE WITH SUCH CONTROL SYSTEM

Paul W. Wagener, Alden, and Loren F. Stringer, Clarence, both of N.Y., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Oct. 30, 1981, Ser. No. 315,600
Int. Cl.³ H02P 5/40
U.S. Cl. 318—711 6 Claims



1. A method of establishing the instant of firing a selected one of an array of thyristors in coincidence with a predetermined firing angle relative to a variable frequency AC line voltage comprising the steps of:

deriving in relation to said AC line voltage with a first counter operative at a predetermined counting rate a first recurrent count initiated upon the occurrence of one zero crossing of said line voltage;

deriving in relation to said AC line voltage with a second counter operative at said predetermined counting rate a second recurrent count initiated upon the occurrence of the opposite zero crossing of said line voltage;

effecting the difference between said first and second recurrent counts to derive in terms of said predetermined counting rate a difference count representing 180 electrical degrees;

initiating with a computer a calculation based on said difference count and involving one of said recurrent counts, the phase shift between a reference line voltage related to said AC line voltage and the commutating voltage of the thyristor "next" to be fired to derive at the end of said calculation a calculated count in terms of said predetermined counting rate which is representative of the number of electrical angles left therefrom before reaching in time said firing angle;

presetting with said calculated count a third counter operative at said predetermined counting rate;

counting down with said third counter from said preset calculated count to zero; and

firing said "next" thyristor when said last counting down reaches zero.

4,427,934
CURRENT LIMITER FOR A LOAD COMMUTATED INVERTER

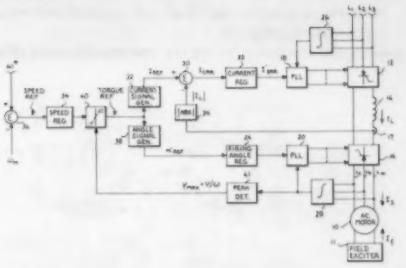
Leland C. Tupper, Schenectady, N.Y., assignor to General Electric Company, Salem, Va.

Filed Jan. 29, 1982, Ser. No. 343,916
Int. Cl.³ H02P 5/40
U.S. Cl. 318—723 22 Claims

1. A method of controlling the torque of a synchronous motor driven by a DC to AC converter coupled to an AC to DC converter via a DC link circuit, comprising the steps of:

(a) generating a torque reference signal;

(b) controlling the motor current in response to torque reference signal; and

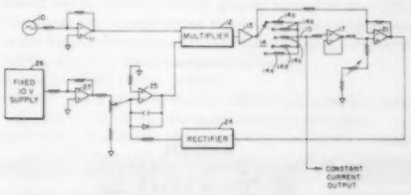


(c) limiting the torque reference signal in response to the peak value of the integral of the motor terminal voltage.

4,427,935
CONSTANT CURRENT SOURCE

Edgar A. Bowden, Arlington, Tex., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Oct. 13, 1981, Ser. No. 310,543
Int. Cl.³ G05F 1/12
U.S. Cl. 323—280 3 Claims



1. A system for correcting for amplitude variation in current flow from an unstable oscillatory current source, comprising:

(a) a resistive element through which the current from said oscillatory current source is passed,

(b) means for producing a reference voltage representative of the voltage differential across said resistive element,

(c) a source of fixed D.C. voltage,

(d) means for integrating the difference between said reference voltage and said fixed D.C. voltage to produce a correction signal representative of an amplitude variation in said current,

(e) means for multiplying the current with said correction signal to correct for said amplitude variation in said oscillatory current source, whereby the current through said resistive element is maintained at a constant level regardless of amplitude instability of the said oscillatory current source.

4,427,936
REFLECTION COEFFICIENT MEASUREMENTS

Gordon P. Riblet, Wellesley, and Bertil E. R. Hansson, Marlborough, both of Mass., assignors to Microwave Development Labs, Needham, Mass.

Filed Jun. 22, 1981, Ser. No. 275,927
Int. Cl.³ G01R 27/04
U.S. Cl. 324—58 B 22 Claims

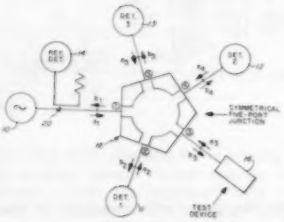
12. A matched lossless reciprocal power divider used for the measurement of reflection coefficient and comprising;

five transmission lines defining five ports of the divider, one of said ports forming an input port and at least another of said ports forming an output port,

a central resonator region,

means intercoupling the transmission lines to the central resonator region to enable power division between the input and output ports,

said central resonator having the transmission lines coupled



therewith in a spaced relation from one to the next transmission line,

first, second and third power level detectors,

means coupling the the first, second and third power level detectors to the remaining three ports, respectively,

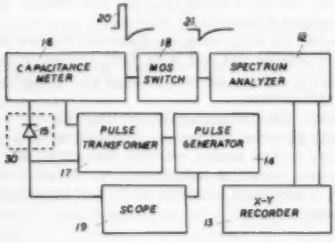
and a directional coupler associated with the transmission line coupling to the one port and including means coupled from the coupler for monitoring the incident power coupled to the resonator region.

4,427,937

METHOD OF MEASURING TIME CONSTANT USING A SPECTRUM ANALYZER

Hung C. Lin, 8 Schindler Ct., Silver Spring, Md. 20903, and Ching D. Wang, 2820 Rainview Dr., San Jose, Calif. 95133

Filed Sep. 25, 1981, Ser. No. 305,376
Int. Cl.³ G01R *23/16*
U.S. Cl. 324—77 B **4 Claims**



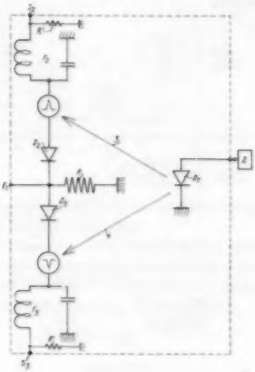
1. A method of measuring the time constant of an exponential waveform, comprising the steps of applying an electrical pulse to a diode, measuring the capacitance of said diode, measuring the capacitance of said diode during the transient response with a capacitance meter, producing an exponential waveform from the output of said capacitance meter, applying said exponential waveform to a spectrum analyzer to derive different Fourier components, calculating the time constant of said exponential waveform from two said Fourier components.

4,427,938

VERY-WIDE-BAND SAMPLERS

Julien Prevot, Paris, France, assignor to Lignes Telegraphiques et Telephoniques, France

Filed Dec. 5, 1980, Ser. No. 213,580
Claims priority, application France, Dec. 27, 1979, 79 31798
Int. Cl.³ G01R *23/02, 23/04*
U.S. Cl. 324—78 D **5 Claims**



1. A very-wide-band sampler comprising:

(a) local oscillation means for generating pulse signals having a short time duration and a predetermined recurrence frequency, said local oscillation means comprising a high-frequency local source associated with a first diode mounted in a first rectangular cross-section of a waveguide element:

(b) said rectangular waveguide element whose cutoff-frequency is a multiple of the said recurrence frequency and comprising, said first diode placed in said first cross-section, a second diode and a third diode connected in series through a conducting bar and placed in a second cross-section of the rectangular waveguide, said conducting bar extending centrally in said waveguide in said second cross-section; said first diode being connected to said local source to transmit said pulse signals within said waveguide, said conducting bar being connected at one end to a signal input for reception of signal whose frequency is to be determined, and connected at its other end to a matched load, said second and third diodes constituting a mixer for beating the said input signal with said transmitted pulse signal; and

(c) low-frequency output circuits for the signals at the beat frequency provided by said mixer, said low-frequency output circuits being constituted by two coaxial line segments placed in the said second cross-section and having the central conductor connected to said second and third diodes respectively.

4,427,939

ELECTRONIC PHASE SEQUENCE INDICATOR FOR THREE-PHASE ELECTRIC SYSTEMS

Gaetano La Nave, Via Roma, 8° Traversa, Palazzo CE.DA.MO, 80017 Melito, Italy

Filed Apr. 10, 1981, Ser. No. 253,156
Claims priority, application Italy, Apr. 11, 1980, 40417 A/80
Int. Cl.³ G01N *25/00*
U.S. Cl. 324—86 **13 Claims**

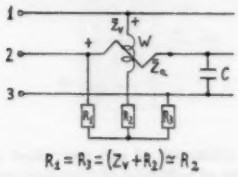
1. An electronic phase-sequence indicator for determining the phase relationships in a three-phase network, comprising:

a single-phase detector-indicator including a voltmeter circuit having a movable pointer, an ammeter circuit insulated from said voltmeter circuit, and a dial divided into

two sectors, said pointer moving between said two sectors and a center portion therebetween;

three impedances each having substantially equal impedance and star-connected to the three-phase network;

said voltmeter circuit being connected in series with one of said three impedances and the input of said voltmeter



circuit being connected to one of said three phases being designated arbitrarily as phase one;

a fourth impedance connected between the other two of said three phases; and

said ammeter circuit being connected to another phase of said three-phase network and to said fourth impedance.

4,427,940

ELECTROMAGNETIC INSPECTING APPARATUS FOR MAGNETIZABLE WIRE ROPE

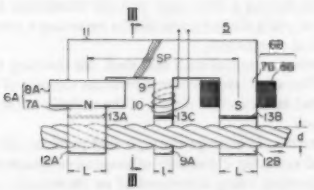
Yutaka Hirama, Ibaraki; Kenzoh Takahashi, Musashino, and Sadayuki Hori, Tokyo, all of Japan, assignors to Hitachi Elevator Engineering and Service Co., Ltd., Tokyo, Japan

Filed Apr. 21, 1981, Ser. No. 256,107

Claims priority, application Japan, Apr. 21, 1980, 55-51661

Int. Cl.³ G01N *27/82*; G01R *33/12*

U.S. Cl. 324—240 **42 Claims**



1. An electromagnetic inspecting apparatus for electromagnetically detecting a defect present in a magnetizable wire rope, said wire rope having a plurality of strands, each of said strands including a plurality of steel wires comprising:

a first magnetic pole disposed opposite to said magnetizable wire rope which moves in its longitudinal direction;

a second magnetic pole having a polarity different from that of said first magnetic pole and disposed opposite to said magnetizable wire rope at a position spaced apart by a predetermined distance from said first magnetic pole in said longitudinal direction, said predetermined distance being selected to be a multiple integer of the strand pitch of said magnetizable wire rope;

a detecting core disposed opposite to said magnetizable wire rope at a position intermediate said first and second magnetic poles;

a detecting coil wound around said detecting core to make a differential response to flows of leakage flux appearing due to the presence of a defect in said magnetizable wire rope thereby generating an electrical output signal indicative of the result of its response; and

a yoke magnetically coupling said first and second magnetic poles and said detecting core at the portions remote from said magnetizable wire rope.

4,427,941

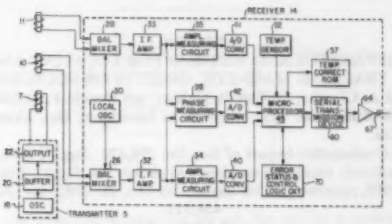
TEMPERATURE COMPENSATED WELL LOGGING TOOL

Roland G. Riedesel, Jr., Spring; Theodore W. Nussbaum, and Wayne F. Warren, both of Houston, all of Tex., assignors to Texaco Inc., White Plains, N.Y.

Filed Aug. 13, 1981, Ser. No. 292,368

Int. Cl.³ G01V *3/28, 3/30*; E21B *47/06*

U.S. Cl. 324—323 **9 Claims**



1. A well logging tool adapted for use in a borehole traversing an earth formation comprising:

characteristic sensing means sensing at least one characteristic of the earth formation and providing corresponding characteristic signals;

temperature sensing means for sensing the ambient temperature and providing a corresponding temperature signal; and

output signal means connected to the characteristic sensing means and to the temperature sensing means for providing a temperature compensated output signal corresponding to the sensed characteristic in accordance with the characteristic signals and the temperature signal;

said output signal means includes:

memory means having stored within it temperature compensated values for characterization signals, and

data correction means for controlling the memory means in accordance with the temperature signal and the characterization signals to select the proper temperature compensated values and for providing the output signal in accordance with the selected temperature compensated values.

4,427,942

CONCEALED ELECTRICAL CONDUCTOR DETECTING SYSTEM

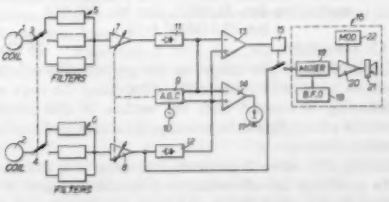
Lloyd H. Sole, Bristol, England, assignor to Electrolocation Limited, Bristol, England

Filed Apr. 21, 1981, Ser. No. 256,232

Claims priority, application United Kingdom, Apr. 29, 1980, 8014094

Int. Cl.³ G01V *3/11*

U.S. Cl. 324—326 **8 Claims**



1. A detection system for concealed current carrying conductors such as underground pipes or cables, comprising two

parallel, spaced first and second coils, respective first and second channels through which the coil outputs are directed, a comparator receiving said coil outputs via said channels to produce its own output corresponding the difference in the coil outputs, an indicator, a further channel from the first coil to the indicator, and gating means in said further channel responsive to the comparator output to pass the first coil output to the indicator only when the signal strength in the first coil is greater by a predetermined amount than that in the second coil.

4,427,943

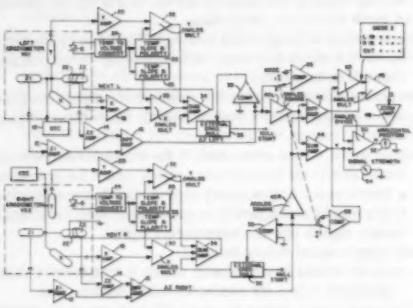
APPARATUS AND METHOD FOR LOCATING AND TRACKING MAGNETIC OBJECTS OR SOURCES

Paul A. Cloutier; Delbert R. Oehme, and Ronald F. Stebbings, all of Houston, Tex., assignors to Innovatum, Inc., Houston, Tex.

Continuation-in-part of Ser. No. 290,670, Aug. 5, 1981, abandoned, which is a continuation of Ser. No. 13,291, Feb. 21, 1979, abandoned. This application Oct. 26, 1982, Ser. No. 436,815

Int. Cl.³ G01V *3/08*

U.S. Cl. 324—326 **36 Claims**



1. Magnetic locating apparatus comprising a pair of spaced gradiometers for producing output signals dependent upon the gradient of a magnetic field associated with a magnetic object to be located, means supporting the gradiometers for movement relative to the magnetic object to be located, and means responsive to the output signals for indicating the location of the magnetic object relative to the gradiometers along a coordinate axis irrespective of the magnetic field signature of the object.

4,427,944

SYSTEM FOR PERMEABILITY LOGGING BY MEASURING STREAMING POTENTIALS

Richard N. Chandler, Houston, Tex., assignor to Schlumberger Technology Corporation, New York, N.Y.

Continuation of Ser. No. 165,997, Jul. 7, 1980, abandoned. This application Jan. 18, 1983, Ser. No. 459,010

Int. Cl.³ G01V *3/18*

U.S. Cl. 324—353 **26 Claims**

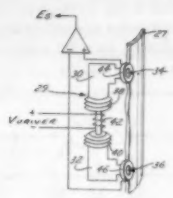
1. A method for investigating the permeability of earth formations traversed by a borehole comprising the steps of:

positioning in contact with the surface of the borehole within a formation to be investigated a source of mechanical excitation;

actuating the source to excite the formation so as to cause to be produced an electrokinetic potential transient in the formation around the area of contact;

measuring the magnitude of the electrokinetic potentials excited in the formation;

determining a characteristic response time for the electrokinetic potentials excited in the formation; and



producing as a function of said determined characteristic response time an indication of formation permeability.

4,427,945

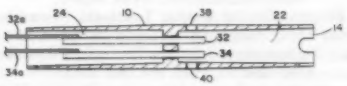
MOLDED CONDUCTIVITY CELL BODY

Elmer A. Sperry, III, Pompton Plains, N.J., assignor to Beckman Instruments, Inc., Fullerton, Calif.

Filed Oct. 28, 1982, Ser. No. 437,401

Int. Cl.³ G01N *27/02*

U.S. Cl. 324—446 **13 Claims**



1. A molded housing for a conductivity cell comprising:

(a) a shell having a first open end for immersion in a test solution, and a second open end for receiving a plurality of electrical conductors,

(b) a partition, integral with said shell, for dividing the interior of the shell into a first region in the vicinity of the first open end and a second region in the vicinity of the second open end

(c) a plurality of openings through said partition for receiving and retaining a plurality of respective electrodes

(d) said housing being composed of an electrically nonconductive material which deforms slightly to establish liquid tight seals between the electrodes and the partition as said electrodes are pushed through respective openings.

4,427,946

MOBILE IONIZATION CHAMBER WITH PORTABLE POWER SUPPLY PACKAGED IN INSULATED HOUSING

Robert A. Chattin, Mundelein, Ill., assignor to Advanced Instrument Development, Inc., Melrose Park, Ill.

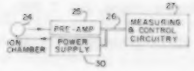
Filed Mar. 16, 1981, Ser. No. 244,169

Int. Cl.³ G01T *1/175;* H05G *1/26*

U.S. Cl. 328—7 **5 Claims**

1. A portable ionization chamber assembly for monitoring X-rays provided to a film cassette positioned adjacent a patient, comprising in combination a housing member of nonconductive material, said housing having an enclosed recess means, an ionization chamber operable at a relatively high voltage mounted in said recess means, voltage amplification circuitry mounted in said recess means, means for coupling an electrical potential of relatively low voltage to said housing and to said voltage amplification circuitry, said voltage amplification circuitry providing a high voltage to energize said ionization chamber and said voltage amplification circuitry

and said ion chamber being entirely enclosed within said housing whereby the patient and the operator are insulated from



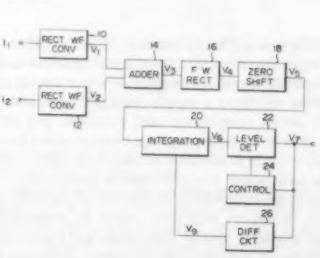
any high voltage necessary for ion chamber operation and hence are not subject to electrical voltage hazards therefrom.

4,427,947

PHASE DISCRIMINATOR CIRCUIT

Sunao Suzuki, Kobe, and Genzaburou Kotani, Akashi, both of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 18, 1981, Ser. No. 293,988
Claims priority, application Japan, Sep. 10, 1980, 55-125810
Int. Cl.³ H03K *9/06, 5/13, 5/22*
U.S. Cl. 328—133 **3 Claims**



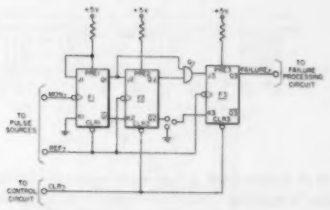
1. An integrating phase discriminator circuit comprising a circuit for delivering an output when a first and a second AC electric quantity are identical in polarity to each other, a zero shifting circuit for shifting a zero point of said output from said circuit, an integration circuit for integrating an output from said zero shifting circuit, a level detector circuit having a first detecting level and a second detecting level which is lower than said first detecting level, said level detector circuit being responsive to said output from said integration circuit reaching said first detecting level so as to produce an output of a first polarity and being responsive to said output from said integration circuit reaching said second detecting level so to produce an output of a second polarity, a control circuit which is responsive to said output of said first polarity from said level detector circuit so as to change said first detecting level to said second detecting level and which is responsive to said output of the second polarity from said level detector circuit so as to change said second detecting level to said first detecting level, and a differentiation circuit for changing said output from said integration circuit to a first limit when said output from said level detector circuit changes from its second polarity to its first polarity and for changing said output from said integration circuit to a second limit when said output from said level detection circuit changes from its first polarity to its second polarity.

4,427,948

PULSE TOGGLE MONITOR CIRCUIT

Gerald M. Rinaldi, Mundelein, Ill., assignor to GTE Automatic Electric Labs Inc., Northlake, Ill.

Filed Dec. 21, 1981, Ser. No. 332,920
Int. Cl.³ H03D *3/04*
U.S. Cl. 328—138 **9 Claims**



1. A pulse toggle monitor circuit for use in a switching system, including a clock signal source normally operated to provide clock signal pulses of a first frequency, and abnormally operated to provide clock signal pulses of a higher frequency, and a reference signal source operated to provide reference signal pulses of first and second polarities and of a frequency at least twice the frequency of said clock signal pulses, said pulse toggle monitor circuit comprising:

first detection means connected to said clock signal source and said reference signal source, operated in response to each reference signal pulse of said first polarity and a contemporaneously occurring clock signal pulse to provide a first pulse detection signal;

said first detection means further operated in response to said reference signal pulse of said second polarity to clear said first pulse detection signal;

at least one other detection means connected in series with said first detection means and further connected to said reference signal source, operated in response to said pulse detection signal from an immediately preceding detection means, and said reference signal pulse of said second polarity to generate a subsequent pulse detection signal;

gating means connected to said first detection means and each other detection means, operated in response to contemporaneously occurring pulse detection signals from said first detection means and each other detection means to provide a pulse toggle detection signal; and

storage means connected to said gating means and said reference signal source, operated in response to said pulse toggle detection signal and said reference signal pulse of said second polarity to provide a pulse toggle failure signal;

whereby said pulse toggle monitor circuit detects said clock signal pulses of said higher frequency.

4,427,949

SIGNAL INTERCEPTING CIRCUIT

Hiroyasu Yamaguchi, and Yasuhiro Kodera, both of Yokohama, Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kanagawa, Japan

Filed Aug. 4, 1981, Ser. No. 290,094
Claims priority, application Japan, Aug. 18, 1980, 55-129473
Int. Cl.³ H03F *1/14, 3/45*
U.S. Cl. 330—51 **3 Claims**

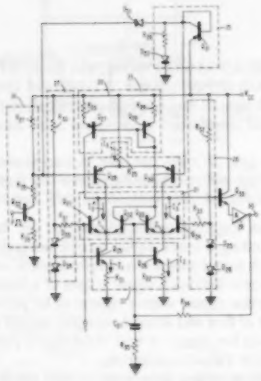
1. A signal intercepting circuit for receiving an intercepting signal having a rising edge and a falling edge, said rising edge occurring during a rising time period and said falling edge occurring during a falling time period, comprising:

a first differential amplifier comprising first and second transistors, the base electrode of said first transistor receiving an input signal;

a second differential amplifier comprising third and fourth

transistors, the collector electrode of said third transistor being connected to the collector electrode of said second transistor, and the collector electrode of said fourth transistor being connected to the collector electrode of said first transistor;

switching means coupled to said first and second differential amplifier and responsive to said intercepting signal, for switching off said first differential amplifier and switching on said second differential amplifier, said switching means



comprising sensing means for sensing the absence of said intercepting signal and switching on said first differential amplifier and switching off said second differential amplifier, said switching means further comprising means for simultaneously switching on said first and second differential amplifiers during said rising time period and said falling time period;

and, an output terminal coupled to said first differential amplifier.

4,427,950

NOISE REDUCTION CIRCUIT

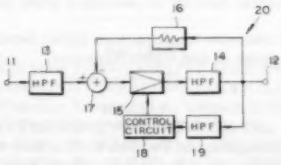
Kenzo Akagiri; Masayuki Katakura, both of Yokohama, and Motomi Ookouchi, Tokyo, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Aug. 31, 1981, Ser. No. 298,099

Claims priority, application Japan, Sep. 3, 1980, 55-121208

Int. Cl.³ H03F *1/26;* H03G *3/10*

U.S. Cl. 330—149 **27 Claims**



1. A circuit for noise reduction comprising:

first means for providing frequency emphasis to a signal supplied thereto;

a first signal path connected in series with said first means, and including variable gain amplifier means having controllable gain for amplifying a signal supplied thereto and second means for providing frequency emphasis to the signal passing through said variable gain amplifier means;

means for controlling the gain of said variable gain amplifier means in response to the level of a signal in said first signal path; and

means having a transfer characteristic substantially independent of frequency connected with said first signal path for reducing the effect of the frequency emphasis by said second means when the level of the signal passing through said variable gain amplifier means is reduced, wherein said circuit for noise reduction provides a first amount of frequency emphasis for intermediate level signals supplied thereto and a second lower amount of frequency emphasis for low level signals supplied thereto.

4,427,951

PROTECTIVE DEVICE FOR POWER AMPLIFIER

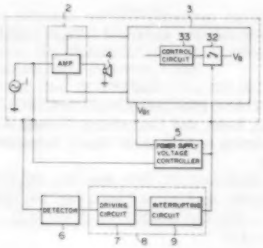
Nobutaka Amada; Harushige Nakagaki, and Shigeki Inoue, all of Toyokawa, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Dec. 29, 1981, Ser. No. 335,545

Claims priority, application Japan, Jan. 7, 1981, 56-279; May 29, 1981, 56-81011

Int. Cl.³ H03F *3/04;* H02H *7/20*

U.S. Cl. 330—298 **11 Claims**



1. In a power amplifier system having an amplifier for amplifying an input signal applied to its input terminal and producing the amplified signal at its output, a power circuit coupled to said amplifier to supply a supply voltage to said amplifier, and a control circuit coupled to said amplifier and said power circuit to generate a supply voltage control signal for changing said supply voltage in response to said input signal, a protective device for said power amplifier system comprising:

a detecting means coupled to said power amplifier system to detect, when an abnormal signal is generated in said power amplifier system, said abnormal signal; and

a cut-off means supplied with the output from said detecting means to cut off the control signal from said control circuit thereby stopping said power supply circuit from changing its power source and supply power to said power amplifier.

4,427,952

OSCILLATOR CIRCUIT WITH DIGITAL TEMPERATURE COMPENSATION

Alphonse Zumsteg, Solothurn, Switzerland, assignor to Societe Suisse pour l'Industrie Horlogere Management Services SA, Bienne, Switzerland

Filed Dec. 30, 1980, Ser. No. 221,384

Claims priority, application Switzerland, Jan. 10, 1980, 158/80

Int. Cl.³ H03L *1/02*

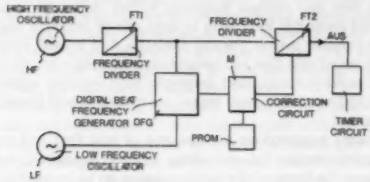
U.S. Cl. 331—176 **6 Claims**

1. An oscillator circuit comprising:

(a) a high frequency oscillator for producing a high frequency signal having a parabolic temperature dependence and an inversion temperature point;

(b) a low frequency oscillator for producing a low frequency signal substantially lower than the high frequency signal having a parabolic temperature dependence differing from that of the high frequency oscillator and the same temperature inversion point; and

(c) temperature compensating circuit means connected to the high and low frequency oscillators for receiving the signals, for dividing the high frequency signal, for determining the difference between the divided high frequency signal and the low frequency signal, and for multiplying the signal difference by a correction factor to produce a correction signal.



4,427,953

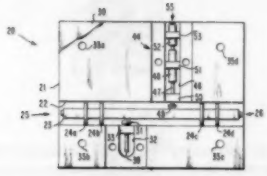
MICROWAVE DIPLEXER

Thomas Hudspeth, Malibu, and Harmon H. Keeling, Kernville, both of Calif., assignors to Hughes Aircraft Company, El Segundo, Calif.

Filed Nov. 16, 1981, Ser. No. 321,359

Int. Cl.³ H01P 1/213

U.S. Cl. 333—134 **9 Claims**



1. A microwave diplexer comprising:

a microwave transmission line;

a band rejection portion comprising a first rejection resonator disposed at a first predetermined position along said transmission line, and a second rejection resonator disposed at a second predetermined position along said transmission line, said second rejection resonator being disposed orthogonal to said first rejection resonator; and

a bandpass portion disposed at a third predetermined position along said transmission line, said bandpass portion including first and second capacitively coupled bandpass resonators, said first bandpass resonator being capacitively coupled to said transmission line.

4,427,954

PULSE COMPRESSION FILTER DESIGNED AS A DISPERSIVE DELAY LINE

Richard Veith, Unterhaching, and Helmut Stocker, Zorneding, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

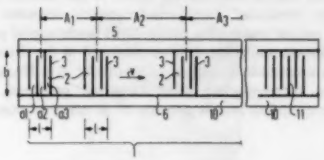
Filed May 12, 1982, Ser. No. 377,466

Claims priority, application Fed. Rep. of Germany, May 29, 1981, 3121516

Int. Cl.³ H03H 9/44, 9/64, 9/145

U.S. Cl. 333—153 **11 Claims**

1. A pulse compression filter designed as a dispersive delay line which functions with acoustic waves and has a prescribed center frequency f_o which produces a corresponding mean wavelength λ_o in the filter, comprising: a substrate; at least one input and at least one output transducer with a plurality of electrode fingers situated at a surface of the substrate, a distribution of the electrode fingers corresponding to a prescribed transfer function which has a prescribed bandwidth B and whose Fourier transform has a prescribed time duration T; electrode fingers being divided into a plurality of N finger groups designed identical to one another with respect to the number of fingers n and corresponding finger spacings of corresponding fingers; each finger group having a length in a propagation direction of the acoustic wave in the filter which is at least equal to said mean wavelength λ_o; center spacings of adjacent finger groups from one another being non-equidistant in accordance with said prescribed transfer function; and the plurality N of the finger groups being greater than the time bandwidth product (T·B).



4,427,955

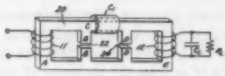
CAPACITOR STRUCTURE FOR INTEGRATED MULTI-STAGE FILTER

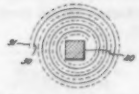
Victor D. Roberts, Burnt Hills, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Nov. 12, 1981, Ser. No. 320,253

Int. Cl.³ H03H 7/09

U.S. Cl. 333—177 **6 Claims**





1. A capacitor for use on cores of material having a high magnetic permeability and capable of being excited by a time varying magnetic field, said capacitor comprising:

a single sheet of spirally-wound conductive material having an insulative layer disposed on one side thereof, said wound sheet having an axially-oriented aperture therein for insertion of said core material, said wound sheet having currents induced therein by said time varying magnetic field passing through the axially-oriented aperture of said wound sheet.

4,427,956

ACOUSTIC WAVE BANDPASS ELECTRICAL FILTERS

Robert J. Murray, Horley, and John Schofield, Coulsdon, both of England, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Apr. 12, 1982, Ser. No. 367,491

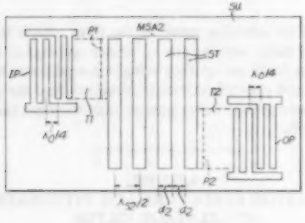
Claims priority, application United Kingdom, Apr. 22, 1981, 8112452

Int. Cl.³ H03H 9/64

U.S. Cl. 333—194 **1 Claim**

1. An acoustic wave bandpass electrical filter including a substrate able to propagate acoustic waves at a surface thereof,

input transducing means arranged to launch acoustic wave energy along a first propagation track at said surface, output transducing means arranged to receive acoustic wave energy from a second propagation track at said surface, and electrical coupling means arranged to receive acoustic wave energy from the input transducing means in the first track and to relaunch at least part of that energy as acoustic wave energy towards the output transducing means in the second track, in which the combined amplitude-frequency response of the input and output tranducing means has a fundamental passband which is substantially the desired passband of the filter with a maximum amplitude response substantially at a frequency f_o and has a corresponding third harmonic passband, and in which the coupling means consists of an array of conducting



strips across the first track and an array of conducting strips across the second track, the conducting strips of each array being discrete parallel strips electrically insulated from each other and strips of the two arrays being electrically connected in pairs with each pair consisting of one strip from each array, at least the majority of the strips of both arrays of the coupling means having a mark-to-space ratio of substantially one-to-one, characterised in that f_o/f_s is in the range 0.80 to 1.14 but excluding substantially 1.0, f_s being the frequency at which the centre-to-centre spacing of at least the majority of said strips is half a wavelength of said acoustic waves, whereby a stopband in the amplitude-frequency response of the coupling means between $2f_s$ and $4f_s$ suppresses the amplitude-frequency response of the input and output transducing means over a range of frequencies including $3f_o \pm 0.5f_o$.

4,427,957

SWITCH ASSEMBLY

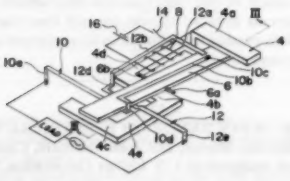
Ryuichi Sato, Kyoto, Japan, assignor to Omron Tateisi Electronics Co., Kyoto, Japan

Filed Jan. 15, 1982, Ser. No. 339,292

Claims priority, application Japan, Jan. 16, 1981, 56-5595

Int. Cl.³ H01H *83/00*

U.S. Cl. 335—19 **34 Claims**



1. A switch assembly comprising:

first and second contact means provided operatively to take one of two positions, a break-position in which the first and second contact means are electrically separated from each other, and a make-position in which the first and second contact means are electrically connected with each other to define a current path therethrough;

biasing means for normally holding said first and second contact means in said break-position;

first and second magnetic bodies provided operatively in association with said first and second contact means such that said first and second magnetic bodies define at least one closed magnetic loop with at least one of said first and second contact means passing through said closed magnetic loop when said first and second contact means are turned to said make-position, said magnetic loop opening when said first and second contact means are turned to said break-position; and

coil means mounted on at least one of said first and second magnetic bodies for providing, when it is excited, a force against the force of the biasing means so as to establish the make-position.

4,427,958

TELEPHONE TRANSDUCERS

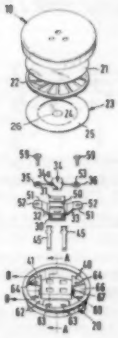
David V. Charlesworth, Seaford, and Derek F. Smith, Shoreham by Sea, both of England, assignors to A. P. Besson Limited, East Sussex, England

Filed Sep. 14, 1982, Ser. No. 417,952

Claims priority, application United Kingdom, Sep. 16, 1981, 8127961

Int. Cl.³ H01F *7/00*

U.S. Cl. 335—231 **14 Claims**



1. A method for making an electro-acoustic transducer which comprises:

arranging with its wall upwards a generally cup-shaped rear cover having a cylindrical wall out-turned at its upper end and extending from the rim of a base divided along a chord into a major segment for receiving an electromagnetic driving unit and a terminal receiving minor segment at a higher vertical level than the major segment, the major segment having on its inner face fixing lands disposed symmetrically with respect to a diameter normal to said chord offset away from the minor segment and extending inwards from the side wall, each fixing land being formed to define a fixing location and having on its face presented to the minor segment an upstanding locator wall;

placing downwards into the rear cover a yoke and coil sub-assembly defined by a cruciform yoke plate of magnetizable material having a magnet at its center with one pair of upturned opposite arms directed along the diameter normal to said chord, the said pair of arms defining pole pieces and carrying coils, and with the other pair of upturned opposite arms parallel to the said chord and formed with outturned fixing ears that settle directly on said lands behind said locator wall with through-holes therein aligning with said fixing locations of said lands;

placing downwardly into the rear cover an armature formed with depending bearing means that settle on the magnet

and permit the armature to rock thereon and a pair of torsion arms extending towards the lands and terminating in fixing ears that settle behind the locator wall on the fixing ears of the coil sub-assembly with through-holes aligning with said fixing locations of said lands, said armature having secured thereto an upstanding connecting rod;

mechanically fixing the armature from above the rear cover in tight contact with the yoke plate and the yoke plate in tight contact with the lands so that the armature is supported for vibration in said rear cover;

introducing connector terminals through said minor segment and electrically connecting the coils to the terminals;

placing downwards onto the rear cover a dished diaphragm so that its rim settles on the out-turned end of the cylindrical wall and the connecting rod projects through a through-hole in said diaphragm;

adhering the connecting rod to the diaphragm; and

assembling a front cover to the rear cover.

4,427,959

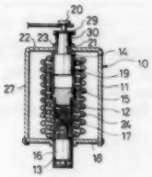
CIRCUIT PROTECTING SENSOR

Takaaki Chuzawa, Osaka, Japan, assignor to Matsushita Electric Works, Ltd., Osaka, Japan

Filed Apr. 6, 1982, Ser. No. 366,099

Int. Cl.³ H01F *7/18*; H01H *43/02*

U.S. Cl. 335—239 **9 Claims**



1. A circuit protecting sensor for protecting an associated circuit from an overcurrent or short-circuit current, comprising a cylinder divided into first and second cylinder bodies coupled axially endwise with a magnetic head interposed between them and fixed thereto, a yoke in which said cylinder is fixed, with said first cylinder body projected partly out of said yoke, a detecting coil wound around the cylinder, a fluid plunger contained together with a viscous fluid in said first cylinder body to a spring-load acting in the direction separating the body to be axially movable toward and away from said magnetic head, a first spring means provided for normally biasing said fluid plunger in a direction away from the magnetic head, an operating plunger contained in said second cylinder body to be axially movable toward and away from the magnetic head in opposing relationship to movements of the fluid plunger, one end of said operating plunger being projected out of the cylinder to be engageable with an actuating part of an external device, and a second spring means provided for normally biasing said operating plunger in a direction away from the magnetic head.

4,427,960

MAGNETIC HOLDER FOR SMALL ARTICLES

Robert P. Wuerfel, 4620 NW. 45th Ct., Fort Lauderdale, Fla. 33319

Filed Dec. 6, 1982, Ser. No. 447,413

Int. Cl.³ H01F *7/20*

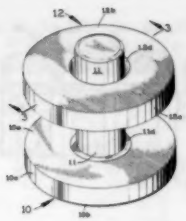
U.S. Cl. 335—285 **9 Claims**

1. A magnetic holder for small magnetically attractable articles comprising:

a base magnet having a magnetically polarized top face of one magnetic polarity;

rigid guide means extending up from said base magnet;

a floating magnet interfitting with said guide means above said base magnet to limit lateral displacement of said floating magnet, said floating magnet having a magnetically polarized bottom face of said one magnetic polarity which is repelled by the top face of the base magnet to offset the downward force of gravity on said floating magnet and maintain said floating magnet spaced above said base magnet; and



said base magnet and floating magnet constructed for attachment of small magnetically attractable articles thereto in the space between said base magnet and said floating magnet.

4,427,961

CHIP TYPE HIGH FREQUENCY COIL DEVICE

Masato Suzuki, Hatoyama, Japan, assignor to Toko, Inc., Tokyo, Japan

Filed Sep. 22, 1982, Ser. No. 421,307

Claims priority, application Japan, Oct. 2, 1981, 56-147466[U]

Int. Cl.³ H01F *15/02, 15/04*

U.S. Cl. 336—83 **2 Claims**

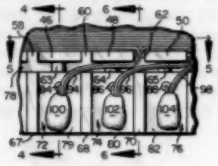
1. A high frequency coil device, comprising a drum core having a square-shaped lower flange, electrodes provided on the bottom surface of said lower flange, a winding or windings wound on said drum core, a cap core covering the winding portion of said drum core, a square-shaped shield casing having a threaded portion with which said cap core is directly intermeshed, wherein lugs are provided at the lower ends of a pair of opposing side walls of the shield casing; said lower ends are located at a higher level than the lower ends of another pair of side walls of the shield casing which are provided with no lugs; the lower ends of those side walls of the shield casing which are provided with the lugs, are disposed in abutment with the upper surface of said lower flange of said drum core; said lugs are disposed in engagement with grooves formed in said surfaces of said lower flange and bent into contact with the bottom surface of the lower flange; and inner surface portions, adjacent to the lower ends, of those side walls of the shield casing which are provided with no lugs, are disposed in engagement with the side surfaces of the lower flange, whereby the shield casing is securely attached to the lower flange of the drum core.

4,427,962

LOW PROFILE TRANSFORMER BOBBIN

Arnold J. Liberman, Skokie, Ill., assignor to Zenith Radio Corporation, Glenview, Ill.

Filed Apr. 26, 1982, Ser. No. 371,689
Int. Cl.³ H01F 15/10
U.S. Cl. 336—192 3 Claims



1. A transformer bobbin adapted for receiving at least one winding having a plurality of winding loops, comprising:

a coil form for supporting said at least one winding thereon;

an upper flange and a lower flange carried by opposite ends of the coil form for containing the winding on the coil form;

a plurality of fingers formed in the lower flange, said fingers being defined by slots in the lower flange which extend to the periphery of the lower flange; and

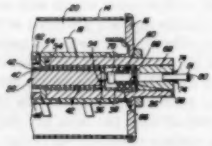
a terminal strip carried by the lower flange beneath said fingers, said terminal strip including a rear wall disposed in perpendicular relation to and extending between the distal ends of said lower flange, a plurality of spaced side walls each extending perpendicularly from said rear wall and aligned beneath a respective one of said slots, said rear and side walls dividing the strip into a plurality of electrically isolated terminal compartments, said compartments being spaced from said fingers by a channel extending between the distal ends of said lower flange such that each of said winding loops may be passed through a respective one of said slots and thence along said channel and into a different one of said compartments, said rear wall including a plurality of apertures each of which extends in spaced parallel relation beneath a respective one of said fingers such that each aperture communicates with one terminal compartment, whereby a tap lead may be fed into a compartment via one of said apertures for connection to a winding loop.

4,427,963

BRAKE AND OPERATION INDICATOR FOR A HIGH-VOLTAGE SWITCH

John M. Jarosz, Skokie, and William R. Panas, Glenview, both of Ill., assignors to S & C Electric Company, Chicago, Ill.

Filed Nov. 1, 1982, Ser. No. 437,925
Int. Cl.³ H01H 85/00
U.S. Cl. 337—6 20 Claims



1. Apparatus for braking and stopping a first moving contact of a switch and for indicating when the switch is open, the switch including a second contact normally electrically interconnected to the first contact when the switch is closed; the switch also including a pressure-generating facility for rapidly moving the first contact away from the second contact along a fixed line of direction to open the switch by breaking the normal electrical interconnection between the contacts in response to a selected condition; the switch being within a housing having an end member closing the housing and intersecting the line of movement; the first contact moving toward the end member as the switch opens; the apparatus comprising

a collapsible, hollow, cylindrical sleeve oriented so that the major axis thereof coincides with the line of direction;

an elongated, cylindrical, two-position pin conformally within, axially slidable relative to, and mounting the sleeve so that the major axis thereof generally coincides with the line of direction, the pin residing within the housing and being not visually observable in its first position, the pin being visually observable and partially residing beyond the end member and outside of the housing in its second position; and

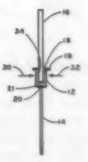
a force-receiving site on an end of the pin against which the rapidly moving first contact abuts as the switch opens, such abutment moving the pin from its first position to its second position and simultaneously collapsing the sleeve in accordion-like fashion to thereby dissipate the kinetic energy of the first contact, the presence of the pin within the sleeve as the latter collapses resulting in such collapse occurring in a controlled manner with the pleats of the collapsing sleeve being constrained by the pin to be generally uniformly formed on the outside thereof.

4,427,964

FUSIBLE LINK ASSEMBLY

Donald R. Ruegsegger, 425 W. Maple St., Waterloo, Ind. 46793

Filed Sep. 28, 1981, Ser. No. 306,161
Int. Cl.³ H01H 85/16
U.S. Cl. 337—231 5 Claims



4. A temperature sensitive fusible link assembly comprising:

(a) a sleeve having an opening at one end of the sleeve and approximately the inner diameter of the sleeve, and an opening of a reduced diameter at the opposite end of the sleeve;

(b) wire means having one end inserted through the reduced diameter opening of the sleeve;

(c) a solder wire fuse with one end received through the larger opening of the sleeve; and

(d) a fused bond between the ends of the solder wire fuse and wire means disposed within the sleeve and comprising the conjoint product of a heat source having been applied to said sleeve after insertion of the ends of the wire means and solder wire fuse.

4,427,965

RESISTOR COOLANT DEVICE

Bent P. Simonsen, 27 Starfish Ct., Newport Beach, Calif. 92663

Filed Jul. 20, 1981, Ser. No. 284,530
Int. Cl.³ H01C 1/082
U.S. Cl. 338—55 2 Claims

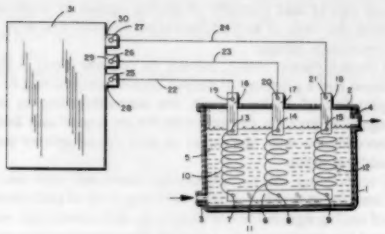
1. A current test tank device for use in testing electric power sources comprising:

(a) A tank capable of containing water as a coolant liquid;

(b) A coolant liquid inlet and outlet to said tank;

(c) A plurality of coil resistors contained within said tank and submerged within said liquid within said tank;

(d) Means of connecting one end of each of said coils to a power source to be tested;



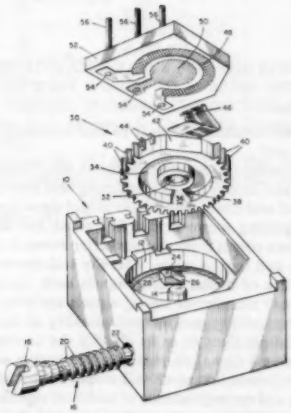
(e) A lining contained in the interior of the tank comprising an electrical insulator.

4,427,966

PIVOTING ROTOR RATCHET MECHANISM FOR WORM GEAR POTENTIOMETER

Paul G. Gratzinger, Moreno, and Lawrence Kucharski, Jr., Sunnymead, both of Calif., assignors to Bourns, Inc., Riverside, Calif.

Filed Nov. 18, 1982, Ser. No. 442,703
Int. Cl.³ H01C *10/32*
U.S. Cl. 338—162 **20 Claims**



1. In a variable resistor, of the type having a housing, a rotor rotatable in said housing and bearing an electrical contact spring in contact with a resistive element, spur gear means on a peripheral edge of said rotor, and worm gear means in said housing for engagement with said spur gear means to drive said rotor between first and second limits of travel, a ratcheting mechanism, comprising:

first means for limiting the further rotation of said rotor substantially beyond said first and second limits of travel; and

second means for pivoting said rotor against the force of said contact spring when said rotor has reached said first and second limits of travel, while allowing momentary disengagement of said spur gear means from said worm gear means;

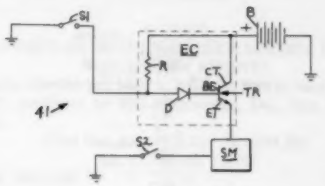
whereby said contact spring is compressed by the pivoting of said rotor at said first and second limits of travel, and said spring is released by the disengagement of said spur gear means from said worm gear means, thereby to urge said rotor into a position in which said spur gear means re-engages said worm gear means.

4,427,967

ELECTRONIC SIGNALING DEVICE

Guiseppe Maiocco, Druento, Italy, assignor to Arman S.p.A., Druento, Italy

Filed Jul. 14, 1981, Ser. No. 283,350
Int. Cl.³ B60Q *1/00*
U.S. Cl. 340—52 D **12 Claims**



1. In a motor vehicle including an ignition switch, a door for entry into and exit from the vehicle, and key-operated locking means operatively associated with the ignition switch, improved signaling apparatus comprising, in combination, a first electrical switch movable between open and closed positions upon insertion of the key into and removal thereof from the locking means, a power source, a resistor, a diode and a transistor having a base, an emitter and a collector, signaling means, a second electrical switch movable between open and closed positions, a first electrical circuit connecting said power source through said resistor and said first switch to ground, a second electrical circuit connecting said power source through the collector and the emitter of said transistor, said signal means and said second switch to ground, and a third electrical circuit connecting said first electrical circuit through said diode to the base of said transistor; said resistor, said diode and said transistor being operably connected in said circuit so that (1) when said first electrical switch is in its closed position, said transistor prevents said signaling means from being energized; while (2) when said first electrical switch is in its open position, said transistor is operable to enable the energizing of said signaling means, whereby, when said first electrical switch is in its open position, said signal means is energized when said second switch is closed, and is not energized when said second switch is open.

4,427,968

DISTRIBUTION NETWORK COMMUNICATION SYSTEM WITH FLEXIBLE MESSAGE ROUTES

Theodore H. York, Raleigh, N.C., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Apr. 9, 1981, Ser. No. 252,682
Int. Cl.³ H04B *3/54*
U.S. Cl. 340—310 R **11 Claims**

1. A communication system for a distribution network, comprising:

a plurality of remote terminals, each containing a plurality of address codes and a role code identifying said remote terminal as an end device;

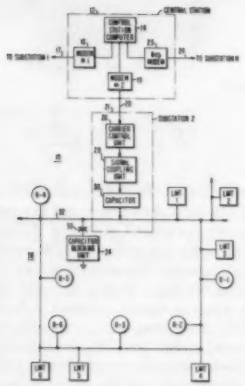
a plurality of signal repeaters, said distribution network connecting each of said signal repeaters with certain of said remote terminals, each of said signal repeaters containing a plurality of stored route and role codes and a preprogrammed unique address code identifying said signal repeater as an end device;

a central station producing an outgoing communication signal intended for a predetermined end device, said outgoing communication signal including a route code identifying a signal path to said predetermined end device, a

role code identifying the first device in said identified route, an address code and a message code; and

a communication link coupling said central station to said distribution network;

each of said signal repeaters includes means for receiving said outgoing communication signal, means for comparing the received address code to said preprogrammed unique address code, and means being responsive to said message code in response to said comparison of the received address code to the preprogrammed address code, and includes means for comparing said received route and role codes to said stored route and role codes, means for re-



moving its role code from the outgoing communication signal and inserting the role code of the next device in said identified route in response to said comparison of the received route and role codes to the stored route and role codes, and means for retransmitting the modified outgoing communication signal such that said message code is ultimately received by said predetermined end device,

each of said remote terminals includes means for comparing the received role code and address code to its role code and its plurality of address codes, and means being responsive to said message code in response to said comparison of the received role code and address code to the stored role code and plurality of address codes.

4,427,969

INTERFACE CIRCUIT FOR A METER READING DEVICE

Vincent G. Coppola, Branford, and John L. Lorenzo, Southbury, both of Conn., assignors to Pitney Bowes Inc., Stamford, Conn.

Filed Mar. 28, 1980, Ser. No. 134,737
Int. Cl.³ H03K *13/02*
U.S. Cl. 340—347 AD **3 Claims**

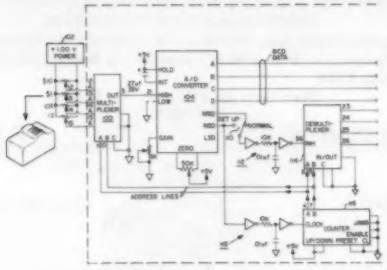
1. A circuit for interfacing a plurality of analog signals to a digital device, said analog signals being adjustable each to represent a physical parameter such as the positions of a corresponding plurality of levers, said circuit providing, in a first mode a first sequence of single digit digital signals, each of said first digital signals approximating one of said analog signals and providing in a second mode a second sequence of digital signals, each of which may be used to calibrate said adjustment of one of said analog signals, said circuit comprising:

(a) a free-running analog-to-digital conversion means for sampling an analog signal and providing a digital output, said digital output signal comprising a most significant digit which approximates said sample analog signal and a subsequent next significant digit which provides, in combination with said most significant digit, a more precise approximation of said sampled analog signal, said conversion means further comprising first and second digit select outputs to strobe said most and said next significant digits respectively;

(b) multiplexer means, having an address input and an output connected to the input of said converter means, for selecting one of said plurality of analog signals in accordance with the value of said address input for conversion by said conversion means;

(c) demultiplexer means, having an address input, a signal input and a plurality of output lines corresponding to said plurality of analog signals, for demultiplexing an input signal to provide an output strobe on one of said lines in accordance with the value of said demultiplexer means address input;

(d) sequencing means operatively associated with said address input for sequentially selecting each of said plurality of analog signals for conversion by said conversion means and for simultaneously selecting the corresponding one of said plurality of demultiplexer output lines, whereby said output strobes identify the correspondence between said digital output and said analog signals, said sequencing means being responsive to signals from said converter



means for selecting the next of said sequence of analog signals; and

(e) switch means for switching between said first and second modes, said switch means connecting said first digit select output of said converting means to said signal input of said demultiplexing means in said first mode and said second digit select output from said converter means to said signal input in said second mode, whereby said circuit provides a sequence of digital output signals each approximating one of said plurality of analog signals and output strobes on corresponding ones of said plurality of the demultiplexer output lines so as to identify the correspondence between said digital outputs and said analog signals and whereby in said first mode said output strobes identify the validity and correspondence of said most significant digits so that said digit may be strobed into said digital device, and said in second mode said output strobes identify the validity and correspondence of said next significant digit so that said analog signals may be adjusted in accordance with said next significant digit so that said analog signals more accurately represent said physical parameters.

4,427,970

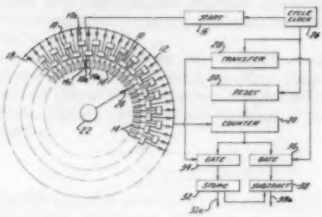
ENCODING APPARATUS

George C. Devol, Wilton, Conn., assignor to Unimation, Inc., Danbury, Conn.

Continuation of Ser. No. 507,082, Sep. 18, 1974, abandoned. This application Aug. 4, 1978, Ser. No. 931,173
Int. Cl.³ H03K *13/02*
U.S. Cl. 340—347 P **33 Claims**

1. A position encoder including a selector, a vast number of pulse-transfer stages interconnected in sequence and including a reference stage, each stage being adapted to respond to a pulse and to provide a pulse to the next stage in the sequence, said stages having respective control devices distributed physi-

cally in an array corresponding to the positions to be encoded, said selector and said array of control devices being movable relative to each other for cooperation of said selector with said control devices in the same sequence as the sequence of interconnection of their respective stages, and said selector being disposed in cooperation with at least one of said control devices at all times during the relative movement of said selector along said array of control devices, an encoding counter, means for delivering a train of pulses to the counter in time



with the transfer of pulses by said stages, and means controlled by the cooperation of the selector with one or more of said control devices for causing the counter to count the number of delivered pulses occurring between the operations of said reference stage and a stage related to one of said control devices at which the selector is disposed, said counter having combination-code output means for providing encoded output representing the relative positioning of said selector and said array of control devices.

4,427,971

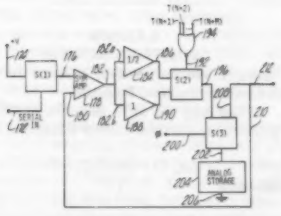
METHOD AND APPARATUS FOR THE CONVERSION OF DIGITAL WORDS TO ANALOG SIGNALS

Arliss E. Whiteside, Melbourne, Fla., and William G. Wolber, Columbus, Ind., assignors to The Bendix Corporation, Southfield, Mich.

Division of Ser. No. 911,603, Jun. 1, 1978, Pat. No. 4,318,085. This application Nov. 24, 1981, Ser. No. 324,717

Int. Cl.³ H03K *13/02*

U.S. Cl. 340—347 DA **9 Claims**



1. A device for converting a n-bit digital word to an equivalent analog signal comprising:

addressable storage array means for outputting a special purpose (n+m)-bit digital word in response to a received n-bit digital word, said addressable storage array means storing a special purpose (n−m)-bit digital word corresponding to each received n-bit digital word, where the weight of each n-bit in said (n+m)-bit digital word is dependent upon its bit position and the weight of the bit positions are related to one another in accordance with a predetermined ratio and the m-bits are equal to one another and repetitive of selected lower order n-bits of the (n+m)-bit digital word; and

recirculating serial (n+m) digital-to-analog converter means having stable but imprecise component values for generating an analog signal in response to the (n+m)-bit digital word output from said storage array means, said analog signal having a value equivalent to the value of said received n-bit digital word and where said n and m bits of said (n+m)-bit digital words stored in said storage array means are selected to correct the generated analog signal for said imprecise component values, said digital-to-analog converter means including means for recirculating said m-bits through a first amplifier having unity gain and for recirculating said n-bits through a second amplifier having a gain equal to the reciprocal of said predetermined ratio.

4,427,972

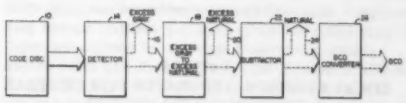
MODULAR SHAFT ENCODER SYSTEM FOR NON-BINARY COUNTS

George D. Haville, and Paul A. Johnson, both of Santa Barbara, Calif., assignors to BEI Electronics, Inc., San Francisco, Calif.

Filed Oct. 23, 1981, Ser. No. 314,204

Int. Cl.³ H03K *13/00*

U.S. Cl. 340—347 P **29 Claims**



1. An encoder system for providing unambiguous, non-power-of-two, even counts corresponding to the angular position of a rotating member, comprising

code means, which are mounted for rotation with the rotating member, for providing an excess code word which is indicative of the position of the rotating member, the excess code word corresponding to one of a plurality of positions of the rotating member, each position having associated with it a unique excess code word, wherein the totality of the excess code words provided by the code means provides a single, truncated, symmetric unit-step-code sequence, the number of words of which corresponds to the system count, the truncated sequence having the form of a full complement, symmetric, unit step sequence the beginning and end of which have been truncated by an equal number of code words; and

means responsive to the excess code word for converting the excess code word into an excess natural word format which is suitable as a system output, as well as readily subjected to further signal processing.

4,427,973

A-TO-D CONVERTER OF THE SUCCESSIVE-APPROXIMATION TYPE

Adrian P. Brokaw, Burlington, and Modesto A. Maidique, Lexington, both of Mass., assignors to Analog Devices, Incorporated, Norwood, Mass.

Division of Ser. No. 931,960, Aug. 8, 1978, which is a continuation-in-part of Ser. No. 785,322, Apr. 7, 1977, abandoned. This application Mar. 25, 1982, Ser. No. 361,747

Int. Cl.³ H03K *13/02*

U.S. Cl. 340—347 AD **7 Claims**

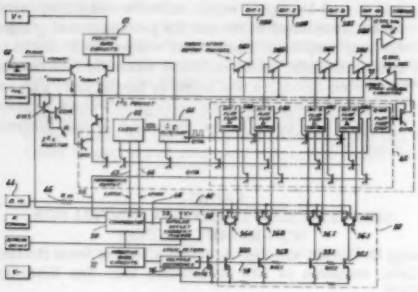
1. Analog-to-digital converter means of the successive-approximation type comprising:

successive-approximation means including a plurality of individual flip-flop registers for storing respective bit signals of a digital output signal;

said successive-approximation means further comprising a set of control flip-flops, with one control flip-flop for each pair of said flip-flop registers; and

circuit means interconnecting said flip-flop registers and said

control flip-flops and responsive to clock pulses for controlling the testing of individual bit sources for comparison with an analog input signal and for storing the result of such comparison in said individual flip-flop registers.



4,427,974

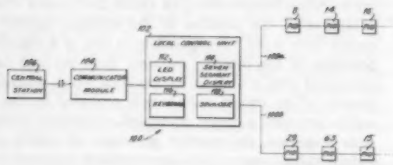
LOCAL CONTROL APPARATUS FOR CENTRAL STATION ALARM SYSTEM

Robert F. Sheahan, Staten Island, N.Y., assignor to American District Telegraph Company, Jersey City, N.J.

Filed Aug. 18, 1982, Ser. No. 409,181

Int. Cl.³ G08B *29/00*

U.S. Cl. 340—539 **3 Claims**



3. In a distributed alarm system including control means; first and second communication circuits extending from the control means; and first and second pluralities of alarm monitoring devices respectively distributed along the lengths of the first and second communication circuits, each alarm monitoring device being connected to the associated communication circuit for communicating with the control means, the improvement comprising:

first and second bridge means respectively connected to the first and second communication circuits at points remote from the control means for selectively connecting together the first and second communication circuits at the location of the first and second bridge means;

fault detection means associated with the control means for detecting the failure of one or more alarm monitoring devices to communicate with the control means and for identifying as possibly faulty the communication circuit associated with those alarm monitoring devices;

bridge control means associated with the control means and responsive to the fault detection means for sending a signal via the communication circuit not identified as possibly faulty to the bridge means associated with that not faulty communication circuit to connect the first and second communication circuits together at the location of the first and second bridge means to attempt to restore communication with the alarm monitoring devices which have failed to communicate with the control means.

4,427,975

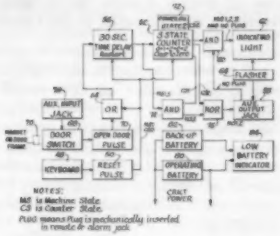
UNOPENED-DOOR INDICATOR

James E. Kinzie, 1742 Sorrel Ct., Carlsbad, Calif. 92008

Filed Apr. 29, 1981, Ser. No. 258,621

Int. Cl.³ G08B *13/08*

U.S. Cl. 340—547 **6 Claims**



1. An unopened-door indicator that shows the returning user of the indicator whether or not the door has been opened since the indicator was last enabled, and which comprises:

a. code input means;

b. a door-actuated switch;

c. an auxiliary output jack;

d. an indicating light;

e. electronic circuitry means responsive to a signal from said code input means when it is properly operated by the user, thereupon driving said indicating light to an un-opened door indication, providing a no-alarm signal to said auxiliary output jack, and providing a first delay of between 10 and 50 seconds before attaining an enabled state, thereupon becoming responsive to a signal from said door-actuated switch at the first opening of the door, thereupon becoming unresponsive to signals from said door-actuated switch, providing an alarm signal to said auxiliary output jack, and after a second delay of between 10 and 50 seconds, driving said indicating light to an opened-door indication; and

f. power supply means for furnishing D.C. power to said code input means and said electronic circuitry means.

4,427,976

MOISTURE SENSOR

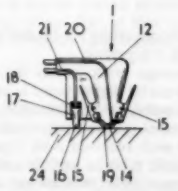
Peter M. Lord, Porthcawl, Wales, assignor to Coal Industry (Patents) Limited, London, England

Filed Aug. 22, 1979, Ser. No. 68,806

Claims priority, application United Kingdom, Aug. 25, 1978, 34715/78

Int. Cl.³ G08B *21/00*

U.S. Cl. 340—604 **12 Claims**



1. A device for sensing moisture on an electrically conductive surface comprising

a supporting member positioned above the surface,

first and second electrical contacts mounted on the supporting member and electrically insulated from one another,

material which is electrically conductive when moist and electrically insulating when dry,

material location means mounted on the supporting member for positioning the material between the first contact and the surface,

bias means for biasing the supporting member toward the surface so that the piece of material is trapped between the first contact and the surface and the second contact is brought into direct electrical contact with the surface, and

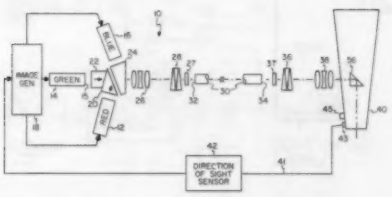
electrical circuit means for applying voltage across the two contacts, said electrical circuit means comprising means for indicating when a current is flowing between the two contacts,

whereby if the surface is moist, the piece of material is moistened and becomes electrically conductive, and the electrical circuit indicates that a current is flowing between the contacts, thereby indicating the presence of moisture on the surface.

4,427,977
VIDEO IMAGE SIMULATION APPARATUS

Jerome T. Carollo, and John A. Waidelich, Jr., both of Ormond Beach, Fla., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Aug. 6, 1981, Ser. No. 290,552
Int. Cl.³ G09G 1/28
U.S. Cl. 340—702 **1 Claim**



1. A video display system, comprising:

three (3) cathode ray tubes, each having a ray axis that is disposed at an angle to the ray axis of the other two, and each producing a monochromatic display image different from the others, such that said ray axes intersect on the viewing side of said tubes when extended;

an image generating computer for controlling the images produced by each of said cathode ray tubes, wherein the first of said tubes produces a red display image, the second of said tubes produces a green display image, and the third of said tubes produces a blue display image;

a matched dichroic prism set of three (3) prisms, each having a display input coupling surface orthogonal to said ray axis of a respective said tube, wherein the display input coupling surface of a first prism of said set is orthogonal to said ray axis of said first tube, the display input coupling surface of a second prism of said set is orthogonal to said ray axis of said second tube, and the display input coupling surface of a thrid prism of said set is orthogonal to said ray axis of said third tube, and wherein a second surface of said second prism abuts a second surface of said first prism, a third surface of said first prism is at an acute angle to said ray axis of said first tube, a second surface of said third prism is separated from said third surface of said first prism by an air space, and a third surface of said third prism is at an acute angle to said ray axis of said third tube, such that said red display image and said green display image are combined in said first prism, and said blue display image is combined with said red and green combined display image in said third prism and together are provided as a polychromatic display image output at said third surface of said third prism;

a first relay lens disposed in substantial optical alignment with said ray axis of said second tube, and in optical alignment with said polychromatic display image output of said third prism;

a first constant deviation prism for separating said image into a plurality of separate distinct wavelength images; said first constant deviation prism being disposed in optical alignment with said first relay lens such that said composite image is focused upon said first constant deviation prism by said first relay lens;

a fiber optic bundle aligned with said first constant deviation prism for transmitting said plurality of distinct wavelength images to a remote location relative to said cathode ray tubes;

a first field lens diposed in optical alignment with said first constant deviation prism and between said first constant deviation prism and said fiber optic bundle for collimating the light rays emitted by said first constant deviation prism;

a second constant deviation prism disposed in optical alignment with said fiber optic bundle for receiving said separate distinct wavelength images from said transmitting means and redintegrating said images into a single composite image;

a second field lens disposed in optical alignment with said fiber optic bundle and between said fiber optic bundle and said second constant deviation prism for collimating the light rays emitted by said light transmitting means;

a second relay lens disposed in optical alignment with said second field lens for focusing said composite image;

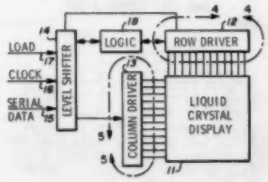
a viewing means in optical alignment with said second relay lens for receiving said focused composite image and displaying said composite image to a viewer; and

means connected to said viewing means for sensing position of said viewing means relative to a fixed reference and for generating control signals for said means for producing display images, such that said means for producing display images produces an image dependent upon the position of said viewing means relative to a fixed reference.

4,427,978
MULTIPLEXED LIQUID CRYSTAL DISPLAY HAVING A GRAY SCALE IMAGE

Marshall Williams, 3590 Turpin Way, Freemont, Calif. 94536, assignor to Marshall Williams, Fremont, Calif.

Filed Aug. 31, 1981, Ser. No. 297,636
Int. Cl.³ G09G 3/36
U.S. Cl. 340—784 **1 Claim**



1. In an apparatus for multiplex driving a field effect liquid crystal display matrix of pixels formed by crossing arrays of row and column electrodes of a display so as to provide a gray scale display image;

row signal generator means for generating a time variable row voltage for application to the array of row electrodes;

row multiplexing means for multiplexing the time variable row voltage to the array of row electrodes of the liquid crystal display matrix of pixels for applying one alternating component of a composite root mean square voltage sequentially across pixels of the matrix of pixels of the liquid crystal display;

column signal generating means for generating a time vari-

able column signal voltage having an alternating component thereof with a root mean square amplitude variable in accordance with a gray scale visual portion of an image to be displayed on the liquid crystal display;

column multiplexing means for multiplexing said column signal voltage onto the array of column electrodes of the liquid crystal display matrix of pixels for sequentially energizing successive pixels of the liquid crystal display matrix with the alternating gray scale component of the column signal voltage so as to display a visual image having a gray scale component;

said column signal generating means including phase modulating means for phase modulating the alternating column signal voltage with the gray scale component of the visual image to be displayed;

said phase modulating means including counter means sequentially responsive to the amplitude of an alternating gray scale signal component representative of the visual portion of the image to be displayed for modulating the phase of the column signal voltage;

said counter means including analog-to-digital converter means responsive to the amplitude of an analog video signal, representative of the gray scale of a visual portion of an image to be displayed, for producing a serial stream of digitally encoded words representative of the gray scale of the visual portion of the image;

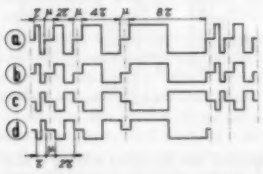
serial-to-parallel converter means responsive to the serial stream of digitally encoded words for converting same to parallel column words, one word for a respective column of the display; and

wherein said counter means includes an array of individual counter means one for each respective column of the display, said individual counter means being responsive to respective ones of said parallel column words for producing an output delayed by the amount of the respective count, thereby phase modulating the output of said counter means in accordance with the gray scale components of the visual portion of the image displayed.

4,427,979
PROCESS FOR THE CONTROL OF AN OPTICAL CHARACTERISTIC OF A MATERIAL BY SIGNALS OF INCREASING TIME PERIODS

Jean F. Clerc, 10, Allee du Pre Blanc, 38240 Meylan, and Jacques Robert, Domain de la Ronce, Les Etanges A5 Rue de la Ronce, 92410 Ville d'Avray, both of France

Filed Oct. 20, 1981, Ser. No. 313,156
Claims priority, application France, Oct. 27, 1980, 80 22930
Int. Cl.³ G09G *3/36*
U.S. Cl. 340—805 **6 Claims**



1. A control process of an optical characteristic of a material for obtaining a display of a plurality of grey levels, said material having a plurality of zones distributed in a matrix-like manner and interposed between a first group of p lines of parallel electrodes and a second group of q columns of parallel electrodes, the lines and columns being crossed, a zone x_iy_j being defined by the region of the material covered by line x_i, in which i is an integer such that $1 \leqq i \leqq p$, and by column y_j, in which j is an integer such that $1 \leqq j \leqq q$, wherein, for controlling the zone x_iy_j of the material, the process includes:

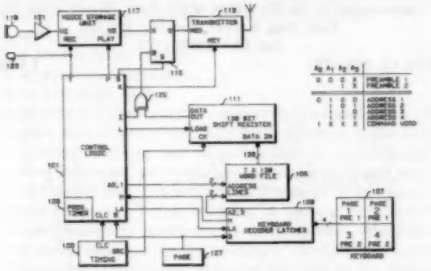
applying a first series of signals with a zero mean value to a line x_i, said first series being divided into n different time fractions of different durations; and

applying a second series of signals with a zero mean value to the column y_j, said second series also being divided into n different time fractions of different durations such that the kth time fraction of the second series of signals is of the same duration as the kth time fraction of the first series of signals, k being an integer such that $1 \leqq k \leqq n$, said second series of signals being such that for each time fraction, the signal of the second series is either in phase opposition or in phase with the corresponding signal of the first series.

4,427,980
ENCODER FOR TRANSMITTED MESSAGE ACTIVATION CODE

Robert D. Fennell, Coral Springs; Allen J. Weidler, Ft. Lauderdale, and David F. Bailey, Plantation, all of Fla., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Oct. 13, 1981, Ser. No. 310,591
Int. Cl.³ H04Q *7/00, 9/00*; H04M *11/02*
U.S. Cl. 340—825.52 **21 Claims**



1. A method of encoding information signals including a receiver address, for transmission of information to a plural population of receivers, each said receiver being capable of selectively establishing more than one time period for address correlation and having a predetermined alert sequence, comprising the steps of:

generating a first set of coded signals to establish one of at least a first and second time period for said plural population of receivers to correlate for an address;

generating a second set of coded signals to select at least one selected receiver of said plural receiver population.

4,427,981
TRACKING FILTER FOR RADIO ALTIMETER

Constantinos S. Kyriakos, Deerfield Beach, Fla., assignor to The Bendix Corporation, Southfield, Mich.

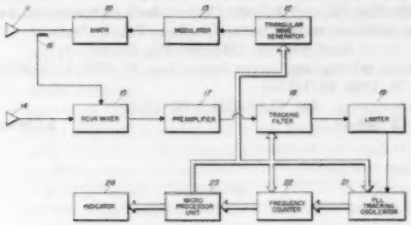
Filed Sep. 28, 1981, Ser. No. 306,038
Int. Cl.³ G01S *9/04*
U.S. Cl. 343—12 A **7 Claims**

1. In an FM/CW radio altimeter, a variable frequency response filter for restricting the frequency band of beat frequency signals processed by the altimeter to measure altitude, said altimeter including means containing in digital format the altitude measured by the altimeter, comprising

a filter section having an attenuation versus frequency characteristic in which attenuation increases with increasing frequency, said characteristic being defined asymptotically by a pair of straight line asymptotes intersecting at a corner frequency;

a switchable network in said filter section, said network including a plurality of discrete circuit components connectable therein to vary the corner frequency at which said asymptotes of said attenuation versus frequency characteristic intersect; and digital means controlled by said

altimeter means containing measured altitude, for connecting selected ones of said circuit components in said



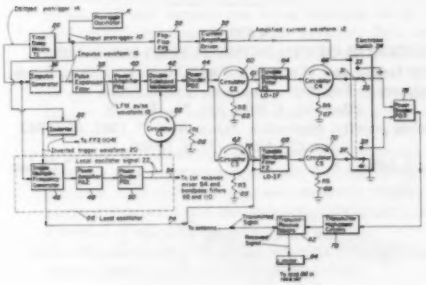
network to cause said corner frequency to decrease as said measured altitude decreases.

4,427,982

RADAR CLUTTER REDUCTION BY USE OF FREQUENCY-DIVERSE, WIDEBAND PULSE-COMPRESSION WAVEFORMS

Samuel J. Caprio, Severna Park, Md., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Apr. 28, 1981, Ser. No. 258,346
Int. Cl.³ G01S 7/28
U.S. Cl. 343—17.2 PC **7 Claims**



1. An apparatus configured to operate with an associated radar system for reducing radar clutter, said apparatus including a transmitter portion and a receiver portion, said apparatus comprising:

a pulse expansion means of said transmitter portion including a filter having know characteristics for generating an impulse waveform, and for linearly frequency-modulating and expanding the impulse waveform into a wideband, linearly frequency-modulated, pulse-compression signal having a predetermined center frequency (IF frequency signal);

a local oscillator means of said transmitter portion operatively connected to said pulse expansion means for generating a local oscillator signal having a stable frequency (LO frequency signal);

a mixer means of said transmitter portion operatively connected to said pulse expansion and said local oscillator means for mixing the IF frequency signal and the LO frequency signal to produce pulse-compression signals at the (LO+IF) frequency and at the (LO−IF) frequency;

a switch means of said transmitter portion operatively connected to said pulse expansion means, said local oscillator means and said mixer means for selectively and alternately passing the (LO−IF) and (LO+IF) pulse-compression signals to a high power transmitter circuit portion and an antenna portion of the associated radar system so as to radiate them alternately at the proper pulse intervals for the associated radar used, said switch means of said transmitter portion including a pair of tunable bandpass filters, one for passing the (LO+IF) pulse-compression signal and other for passing the (LO−IF) pulse-compression signal, said pair of tunable bandpass filters receiving their tuning signal from said local oscillator means;

an echo derivation means of said receiver portion operatively connected to said local oscillator means of said transmitter portion for deriving return signals from the antenna portion of the associated radar system;

a mixer means of said receiver portion operatively connected to said echo derivation means and said local oscillator means of said transmitter portion for receiving as one input the LO frequency signal;

a switch means of said receiver portion operatively connected to said echo derivation and mixer means of said receiver portion for coupling the derived signals to said mixer means, the LO frequency signal being removed in said mixer means;

a pulse-compression means of said receiver portion operatively connected to said mixer means of said receiver portion for compressing the output pulses therefrom thereby generating compressed pulses, said pulse-compression means being a filter matched to the filter characteristics of said pulse expansion means of said transmitter portion;

a correlation means of said receiver portion operatively connected to said pulse-compression means for correlating each of the compressed pulses with the succeeding ones thereof, the output of said correlation means being a signal in which the target returns from the associated radar system are correlated and the clutter returns therefrom are decorrelated; and

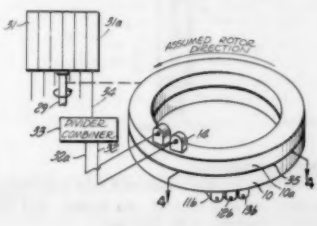
a timing means operatively connected to said transmitter and receiver portions so as to cause initiation of the impulse waveform of said pulse expansion means of said transmitter portion, and so as to cause activation of said switch means of both said transmitter and receiver portions.

4,427,983

LOSSLESS ANNULAR ROTARY RF COUPLER

Bradford E. Kruger, and John C. Parr, both of Woodland Hills, Calif., assignors to International Telephone & Telegraph Corporation, New York, N.Y.

Filed Dec. 24, 1981, Ser. No. 334,231
Int. Cl.³ H01Q 3/02
U.S. Cl. 343—763 **7 Claims**



1. A rotary, annular, radio-frequency coupler system having rotor and stator members each including a contiguous series of spaced conductive webs extending radially between inner and outer concentric conductive cylindrical surfaces to divide said rotor and stator members each into a series of cells, said rotor and stator members each being open and facing each other at an annular planar interface, said rotor and stator being arranged concentrically and having said inner cylindrical surfaces of each of the same diameter and said outer cylindrical surfaces of each of the same diameter, thereby forming an

annular interface for transfer of radio-frequency energy between said rotor and said stator, and comprising:

first means including a transmission line having a common port at a first end and distributed taps along said line, said taps each feeding a discrete connecting line to a corresponding one of said stator substantially equal interface area first cells, said taps each providing a predetermined fraction of the energy at said tapped line input, the sum of the energies at said taps being less than at said common port;

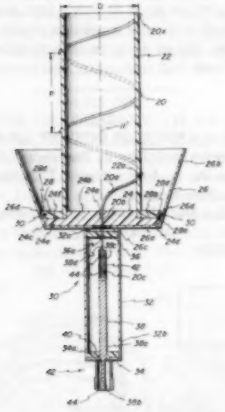
a single second cell among said first cells and second means discretely connecting the second end of said tapped line to said second cell, said second cell having interface area adjusted to compensate for the differing energy at said tapped line second end as compared to the energy at each of said first cells, thereby to afford circumferentially uniform energy density at said interface.

4,427,984

PHASE-VARIABLE SPIRAL ANTENNA AND STEERABLE ARRAYS THEREOF

Roy E. Anderson, Scotia, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Jul. 29, 1981, Ser. No. 288,092
Int. Cl.³ H01Q 1/36
U.S. Cl. 343—764 28 Claims



1. An antenna comprising:

a conductive helix having a feed end, said helix being rotatable around an axis thereof and having said feed end positioned essentially upon said axis;

an insulative support tube upon which said helix is mounted; and

means for matching the helix feed end impedance to a desired impedance and including a conductive ground plane member having a surface at least a portion of which is in a plane substantially perpendicular to said axis and fixedly mountable; and

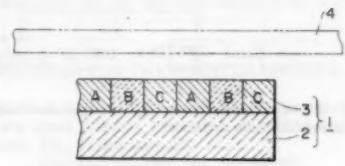
an insulative member fixedly attached to said support tube and having a first surface located adjacent to said ground plane member surface to enable said tube and helix to rotate about said axis.

4,427,985

THERMORECORDING MEDIUM, MEANS AND PROCESS FOR PRODUCING AND UTILIZING SAME

Yoshiki Kikuchi, and Takashi Ohmori, both of Kanagawa, Japan, assignors to Fuji Xerox Co., Ltd., Tokyo, Japan

Filed Aug. 25, 1981, Ser. No. 296,040
Claims priority, application Japan, Aug. 29, 1980, 55/118355; Aug. 29, 1980, 55/118356
Int. Cl.³ G01D 9/00, 15/10
U.S. Cl. 346—1.1 8 Claims



1. A thermal recording medium, comprising:

a base support layer;

a plurality of heat sensitive ink materials positioned on a surface of said base support layer, each of said heat-sensitive ink materials having a different melting point,

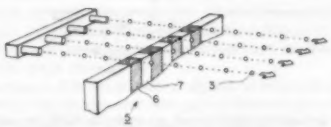
wherein said heat-sensitive ink materials comprises; a single layer having three heat-sensitive ink materials of different melting points positioned on said surface of said support in a regular pattern.

4,427,986

METHOD OF CHARGING JETTED INK DROPS

Tetsuo Iyoda, and Masayoshi Tamai, both of Ebina, Japan, assignors to Fuji Xerox Co., Ltd., Tokyo, Japan

Filed Feb. 1, 1982, Ser. No. 344,689
Claims priority, application Japan, Apr. 17, 1981, 56-57942
Int. Cl.³ G01D 15/18, 18/00
U.S. Cl. 346—1.1 7 Claims



1. A charging method for a binary type multi-nozzle ink jet printer, comprising the steps of:

disposing a confrontation type charging electrode member only on one side of a plane defined by flying paths of separate ink drops separately jetted by a multi-nozzle ink jet so that spaced apart electrodes forming said electrode member confront said ink drops but are spaced away from said ink drops; and

applying a guard voltage to first and second ink drops located on both sides of a printing ink drop, said first and second ink drops and said printing ink drop being located on a line traverse to said flying paths.

4,427,987

MAGNETIC LATENT IMAGE FORMING APPARATUS

Yoshiki Kikuchi, Kanagawa, Japan, assignor to Fuji Xerox Co., Ltd., Kanagawa, Japan

Filed Oct. 6, 1981, Ser. No. 309,135
Claims priority, application Japan, Oct. 7, 1980, 55-139411
Int. Cl.³ G01D 15/12
U.S. Cl. 346—74.4 2 Claims

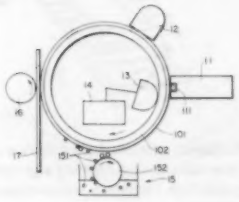
1. A copying machine comprising:

a rotatable drum-shaped support;

a CrO_2 magnetic medium disposed on an outer surface of said support;

an initial magnetization unit extending parallel to an axis of rotation of said support, said initial magnetization unit applying a magnetic field to said magnetic medium to uniformly magnetize said magnetic medium in a predetermined direction;

a laser-type thermal recording head said recording head being disposed adjacent said initial magnetization unit on a side thereof in a direction of rotation of said support, said recording head heating portions of said magnetic medium to a temperature of approximately 110° C. in response to control signals applied thereto to magnetize said magnetic medium in a pattern representing an image to be copied;



a bias magnetic field source extending parallel to said axis of rotation of said support and being disposed on an inner surface of said support, said bias magnetic field source being disposed adjacent said recording head in said direction of rotation of said support, said bias magnetic field source applying a varying magnetic field to said magnetic medium in a direction opposite said predetermined direction;

a developer section comprising a supply of magnetic toner particles and a rotating toner roll for supplying toner particles from said supply to said magnetic medium at a position following said bias magnetic field source in said direction of rotation of said support; and

means for transferring magnetic toner particles adhering to said magnetic medium to a recording sheet.

4,427,988

IMAGE PRINT HEAD

Alain de Kermadec, Rochefort en Yvelines; Christian Delanoe, Versailles, and Gerard Normand, Montferrand le Chateau, all of France, assignors to Societe Anonyme dite Compagnie Industrielle des Telecommunications CIT-Alcatel, Paris, France

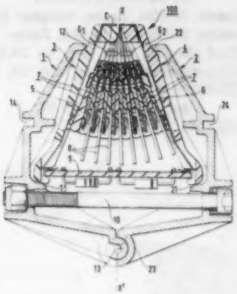
Filed Mar. 8, 1982, Ser. No. 356,018

Claims priority, application France, Mar. 6, 1981, 81 04482

Int. Cl.³ G01D *15/06*

U.S. Cl. 346—155 **11 Claims**

1. A print head comprising a plurality of styluses which are regularly spaced out along at least two parallel lines, with the styluses being off-set relative to one another from one line to the next, said styluses being formed by the tips of respective electrical conductor pins which are rectilinear at least over a portion of their length which is near to said stylus-forming tips, the improvement comprising means for mounting said pins in a plurality of tiers with the tips of the pins in each tier being aligned and regularly spaced, and at least said rectilinear portions of the pins lying parallel to one another, and wherein each line comprises interdigitated stylus tips from a group of n tiers of pins, where n is an integer greater than 1, with every n-th tip in the line belonging to the same tier, and with the parallel portions of said tiers occupying respective planes that fan out from said line, and means for stacking the different



groups of tiers of pins whose tips constitute the different lines of styluses into a single assembly.

4,427,989

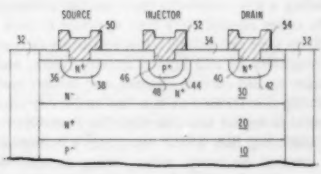
HIGH DENSITY MEMORY CELL

Narasipur G. Anantha, Hopewell Junction; Harsaran S. Bhatia; Santosh P. Gaur, both of Wappingers Falls, and James L. Walsh, Hyde Park, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Aug. 14, 1981, Ser. No. 293,546

Int. Cl.³ H01L *29/74*

U.S. Cl. 357—21 **10 Claims**



1. A dynamic semiconductor memory cell comprising:

a substrate;

a first layer of one conductivity type formed on said substrate;

a second layer of one conductivity type formed on said first layer, said second layer lightly doped with respect to said first layer;

an injector region formed on the surface of said second layer of a doped opposite conductivity type;

a heavily doped first region of said one conductivity type surrounding said injector region within said second layer; and

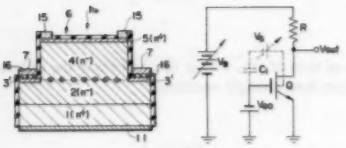
heavily doped second and third regions of said one conductivity type formed on the surface of said second layer defining source and drain regions.

4,427,990

SEMICONDUCTOR PHOTO-ELECTRIC CONVERTER WITH INSULATED GATE OVER P-N CHARGE STORAGE REGION

Jun-ichi Nishizawa, Sendai, Japan, assignor to Zzidan Hojin Handotai Kenkyu Shinkokai, Sendai, Japan

Filed May 15, 1979, Ser. No. 39,445
Claims priority, application Japan, Jul. 14, 1978, 53-86572; Jul. 18, 1978, 53-87988
Int. Cl.³ H01L 29/80
U.S. Cl. 357—22 6 Claims



1. A static induction transistor type semiconductor photo-electric converter having a substrate and including at least one unit, each unit comprising:

a high-resistivity semiconductor region of one conductivity type having an impurity concentration of the order of 1×10^{14} cm^{-3} and predetermined dimensions constituting at least one current channel having two ends;

a pair of current electrode means comprising low-resistivity semiconductor regions of said one conductivity type and connected to said two ends of said current channel for receiving a main voltage from an external voltage source;

a control electrode means formed adjacent to and surrounding said current channel for controlling current between said current electrode means, said control electrode means including a low resistivity semiconductor storage region of the other conductivity type opposite to said one conductivity type and having a low resistivity as compared to the resistivity of said high-resistivity region and formed adjacent to said current channel, and further including an insulating film formed on said low resistivity semiconductor storage region and a conductive electrode formed on said insulating film which comprises a storage capacitor, said control electrode means being capable of storing charge carriers of the other conductivity type opposite to said one conductivity type and thereby varying the potential thereof to control current between said current electrode means;

a light receiving means formed in the neighborhood of said current channel for introducing external light at least into part of said semiconductor region; and

at least one depletion layer formed in said semiconductor region extending from said control means to selectively pinch off said current channel due to said impurity concentration and predetermined dimensions, and forming a potential barrier in said current channel having a height in accordance with the potential of said control means and the potential of one of said current electrode means,

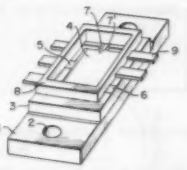
said current electrode means and said current channel being configured substantially perpendicular with respect to said substrate.

4,427,991

HIGH FREQUENCY SEMICONDUCTOR DEVICE

Shigeyuki Yamamura; Kinjiro Kosemura; Takao Shima, and Norio Hidaka, all of Kawasaki, Japan, assignors to Fujitsu Limited, Kawasaki, Japan

PCT No. PCT/JP79/00323, § 371 Date Aug. 26, 1980, § 102(e) Date Aug. 20, 1980, PCT Pub. No. WO80/01437, PCT Pub. Date Jul. 10, 1980
PCT Filed Dec. 22, 1979, Ser. No. 206,543
Claims priority, application Japan, Dec. 28, 1978, 53-164786
Int. Cl.³ H01L 23/02
U.S. Cl. 357—74 20 Claims



1. A high frequency semiconductor device comprising:

(a) a metal base substrate for forming a ground electrode and for fixing said high frequency semiconductor device to an external element;

(b) a function device mounted on said metal base substrate, comprising a plurality of first circuit elements including at least:

(i) a first semiconductor device,

(ii) a DC circuit to power said function device, and

(iii) high frequency coupling circuit for functionally cascade-connecting said first semiconductor device with an external high frequency device;

(c) a frame-shaped insulating substrate mounted on said metal base substrate for surrounding said function device and having a plurality of independent metallized or metallic parts fixed on its surface for connection with an external circuit; and

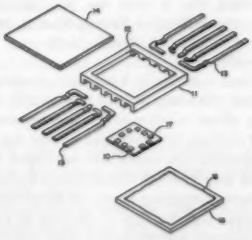
(d) sealing means for hermetically sealing said function device.

4,427,992

METHOD FOR INCORPORATING A DESICCANT IN A SEMICONDUCTOR PACKAGE

Kim Ritchie, Phoenix, and James N. Smith, Tempe, both of Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Continuation of Ser. No. 641,866, Dec. 17, 1975, which is a division of Ser. No. 475,723, Jun. 3, 1974. This application Nov. 14, 1977, Ser. No. 851,337
Int. Cl.³ H01L 23/36
U.S. Cl. 357—78 8 Claims



1. A method of packaging a semiconductor chip in a hermetic enclosure formed by assembly of a first enclosure portion bearing said semiconductor chip to a second enclosure

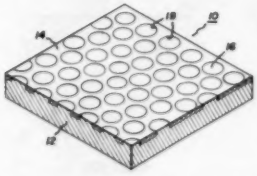
portion, said enclosure including a desiccant, the improvement comprising placing a coating of a liquid material consisting essentially of ethyl alcohol, water, ethyl acetate, tetraethylorthosilicate, and 0.1% to 10% by weight of a metallic ion selected from the group consisting of boron, aluminum, and phosphorus, on part of said second enclosure portion prior to said assembly, and drying said coating in the range 80°–500° C. to provide a desiccant adherent to said second enclosure portion.

4,427,993

THERMAL STRESS RELIEVING BIMETALLIC PLATE

Julie Y. Fichot, Skaneateles, and Alfred Roesch, Auburn, both of N.Y., assignors to General Electric Company, Syracuse, N.Y.

Filed Nov. 21, 1980, Ser. No. 209,001
Int. Cl.³ H01L *23/02*
U.S. Cl. 357—81 **12 Claims**



1. In combination with a semiconductor element having a predetermined thermal coefficient of expansion, a thermally and electrically conductive plate for receiving in direct contact therewith said semiconductor element, said plate comprising:

a body of a first material characterized by a first thermal coefficient of expansion;

a semiconductor element receiving surface on said body; and a lattice of thermal coefficient of expansion modifying material embedded in and flush with said body at said semiconductor element receiving surface which changes the thermal coefficient of expansion of said body at said surface to an intermediate value between said predetermined thermal coefficient of expansion and said first thermal coefficient of expansion.

4,427,994

COLOR SEPARATOR FOR A VIDEO DISPLAY GENERATOR

Mitchell Aron, Harrington Park, and Rover, Jr., Ralph R., Cresskill, both of N.J., assignors to The Bendix Corporation, Teterboro, N.J.

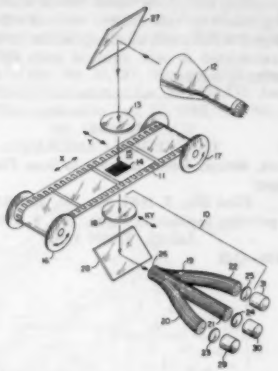
Filed Mar. 15, 1982, Ser. No. 358,151
Int. Cl.³ H04N *9/11*
U.S. Cl. 358—54 **9 Claims**

1. A color separator for a color display video generator wherein a point beam of light is used to scan means upon which information is stored in color to thereby be modulated with color information creating an optical signal representing said information and the color separator separates the optical signal into different colors which are then processed by the video generator into a video signal which is used to display the information on a color display, and wherein the color separator comprises:

means upon which the color modulated point beam of light impinges and is expanded to larger than said point,

light conducting means to which said expanded light beam is input for transmission therethrough, the output of said light conducting means being divided into a plurality of outputs, and

a plurality of filters each passing light of a different color, one of said plurality of filters being located at each of said plurality of outputs and cooperates therewith such that the color modulated light passing through said light conducting means is divided into different colors as it is output from the combination of individual ones of said plurality of outputs and a color filter.

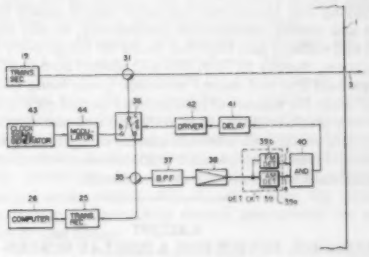


4,427,995

FAIL-SAFE CATV SYSTEM CENTER FACILITY

Akihiko Naito, Tokyo, Japan, assignor to Pioneer Electronic Corporation, Tokyo, Japan

Filed Dec. 11, 1981, Ser. No. 329,914
Claims priority, application Japan, Dec. 22, 1980, 55-182663
Int. Cl.³ H04N *7/10*
U.S. Cl. 358—86 **3 Claims**



1. In a CATV system in which a central facility is coupled through cables to a number of terminal units and two-way data communication is effected therebetween, said central facility comprising:

normal down data signal transmitting means;

abnormality detecting means connected to said data signal transmitting means for detecting a down data signal abnormality in a down data signal produced by said down signal data transmitting means, said abnormality detecting means including an FM detector responsive to the down data signal, an AM detector, responsive to an information carrier signal and AND gate means having first and second inputs coupled, respectively, to outputs of said FM detector and said AM detector, an output of a AND gate means being coupled to control a switching position of said switching means;

back-up transmitting means for producing a clock signal by modulating a carrier signal to form a frequency shift keyed signal having the same frequency as that of said down data signal; and

said switching means for stopping, when said abnormality

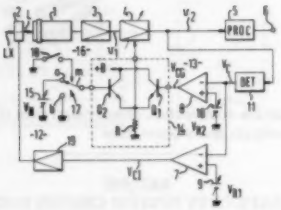
detecting means detects that said down data signal is in an abnormal condition, transmission of said down data signal and coupling said clock signal fromm said back-up transmitting means to said cables, wherein when said down data signal is abnormal, clock signals for down data signals are transmitted to said terminal units by said back-up transmitting means.

4,427,996

TELEVISION CAMERAS

Eiji Tamura, Atsugi, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Dec. 3, 1981, Ser. No. 327,085
Claims priority, application Japan, Dec. 8, 1980, 55-172756
Int. Cl.³ H04N *3/26*
U.S. Cl. 358—228 **6 Claims**



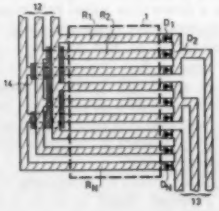
1. A television camera comprising pick-up means, iris means, variable gain amplifier means for a picked-up signal, and first and second comparators for comparing the video level of the picked-up signal as supplied from said variable gain amplifier means with first and second reference levels and respectively supplying first and second compared output signals from said first and second comparators, respectively, to said iris means and said variable gain amplifier means for respectively controlling them, thereby to form first and second automatic control loops, said first and second reference levels being selected so that, when the amount of light incident on said pickup means is above a predetermined value, only said first automatic control loop is actuated, and, when the amount of light incident on said pick-up means is below said predetermined value, only said second automatic control loop is actuated.

4,427,997

CONTROL DEVICE FOR A DISPLAY SCREEN AND DISPLAY SCREEN CONTROLLED BY THIS DEVICE

Michel Hareng; Robert Hehlen; Serge Le Berre; Pierre Leclerc; Philippe Marcenac, and Jean-Noël Perbet, all of Paris, France, assignors to Thomson-CSF, Paris, France

Filed Dec. 8, 1981, Ser. No. 328,497
Claims priority, application France, Dec. 15, 1980, 80 26544
Int. Cl.³ H04N *5/74*
U.S. Cl. 358—236 **6 Claims**



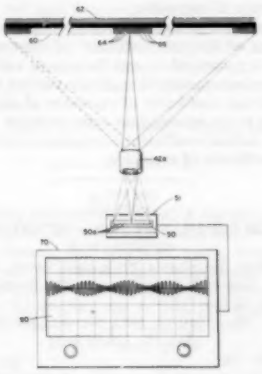
1. A control device for a display screen reproducing images scanned in the form of a frame of lines and columns and represented by a video signal, said screen comprising a layer of a material on which a recording or inscription can be made by a mixed thermal and electric effect in which the lines of the frame, constituted by heating lines deposited on a substrate are sequentially recorded by means of a current, wherein for a definition of N lines the devise comprises $2\sqrt{N}$ electronic devices for controlling the current in the lines, said devices being arranged in the form of $\sqrt{N}$ devices connected to one end of $\sqrt{N}$ groups of lines and of $\sqrt{N}$ devices each of which is connected to the other end of a single line of each of the $\sqrt{N}$ groups of lines, each line being constituted by a heating resistor in series with a diode.

4,427,998

APPARATUS FOR ADJUSTING A FACSIMILE DOCUMENT SCANNER

Francis E. Huntoon, Des Plaines, Ill., assignor to Teletype Corporation, Skokie, Ill.

Filed Apr. 15, 1982, Ser. No. 368,618
Int. Cl.³ H04N *1/10*
U.S. Cl. 358—294 **5 Claims**



1. In combination with a facsimile scanner **(10)** comprising a cabinet **(12)** having a plurality of walls and a generally rectangular opening **(18)** in a first wall **(16)** thereof, said first wall **(16)** having an inner and an outer surface, a transparent pane **(20)** document support table covering said opening **(18)**, an elongated flat, thin strip **(62)** with one surface thereof displaying test indicia **(64, 66)**, said strip **(62)** being secured to the inner surface of said first wall **(16)** of said cabinet **(12)** adjacent one edge of said opening **(18)** with said indicia **(64, 66)** facing toward the interior of the cabinet **(12)**, a movable scanning assembly **(21)** mounted within said cabinet **(12)**, an adjustable optical system **(23)** for focusing onto a linear photodiode array **(50)**, an image of portions of documents placed upon the pane **(20)** and said test indicia for generating electrical signals related to the information on the scanned document and said test indicia.

4,427,999

HIGH SPEED IMAGING OF ELECTROPHOTOGRAPHIC FILM BY FINE BEAM SCANNING

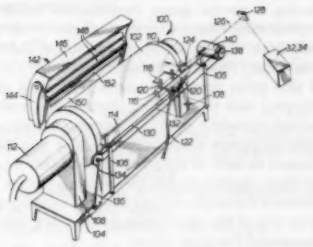
Manfred R. Kuehnle, Lexington, Mass., and Lysle D. Cahill, Dayton, Ohio, assignors to Coulter Systems Corporation, Bedford, Mass.

Division of Ser. No. 803,575, Jun. 6, 1977, abandoned. This application May 27, 1980, Ser. No. 153,689

The portion of the term of this patent subsequent to Jan. 24, 2001, has been disclaimed.

Int. Cl.³ H04N *1/24*

U.S. Cl. 358—300 21 Claims



1. A method of high speed electrophotographic imaging which comprises:

A. scanning in accordance with a predetermined scanning pattern a master image with a reading beam of radiant energy that can be modulated by optical variations in accordance with the copy to be imaged,

B. converting the modulations into a stream of electric signals related to said variations,

C. storing the stream of electrical signals,

D. converting the stored stream of electrical signals at any time after storage into a fine writing beam radiant energy and modulating said radiant energy writing beam in a predetermined relation to the modulations of the reading beam,

E. providing an electrophotographic member having a charge-accepting thin film, transparent, microcrystalline, electrically and optically anisotropic, high quantum gain, wholly inorganic photoconductive coating,

F. charging the photoconductive coating in darkness a portion at a time progressively to a surface charge potential capable of being fully discharged by said writing beam in accordance with the modulations thereof;

G. thereafter immediately substantially completely discharging selected ones of charged increments of the charged portion of the photoconductive coating by directing the modulated fine writing beam in darkness selectively and sequentially at high speed in the order of nanoseconds for each charged increment which is discharged in accordance with the modulations of said writing beam to produce an overall latent image on the photoconductive coating progressively at said high speed which image is representative of the content of the image to be copied formed of regular geometric shapes consisting of charged increments of said surface and fully discharged increments of said surface, the charge level of the charged increments being maintained subject only to dark decay and

H. thereafter developing the overall latent image subsequent to completion of the formation of said overall latent image.

4,428,000

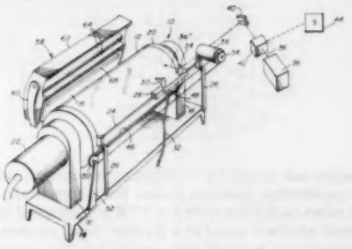
HIGH SPEED IMAGING OF ELECTROPHOTOGRAPHIC FILM BY FINE BEAM SCANNING

Manfred R. Kuehnle, New London, N.H., and Lysle D. Cahill, Dayton, Ohio, assignors to Coulter Systems Corporation, Bedford, Mass.

Continuation of Ser. No. 39,737, May 16, 1979, abandoned, which is a continuation-in-part of Ser. No. 803,575, Jun. 6, 1977, abandoned. This application Jun. 12, 1981, Ser. No. 273,211

Int. Cl.³ H04N *1/30*

U.S. Cl. 358—300 19 Claims



19. Apparatus for forming a tonable latent electrostatic image on an electrophotographic member having a wholly inorganic, microcrystalline, optically and electrically anisotropic, photoconductive coating comprising:

(a) a charging device for applying a charge to the coating, the charging device having a single corona generating needle,

(b) means for producing a fine beam of radiant energy of a level capable of fully discharging the charged coating,

(c) means for modulating the fine beam of radiant energy with data related to the image to be formed,

(d) means for mounting said corona needle and said fine beam at a fixed spacing therebetween, and

(e) drive means for moving both the corona needle and the fine beam over the photoconductive coating in concert maintaining the fixed spacing progressively successively to charge and to expose the photoconductive coating to the fine beam, producing thereby a latent image formed of fully discharged dot areas in the midst of uniformly charged areas subject only to dark decay, the relative distribution and proximity thereof determining the grey scale of said image.

4,428,001

EDITING CONTROL APPARATUS FOR VIDEO TAPE RECORDERS

Kazumasa Yamamura, and Mamoru Ishiguro, both of Atsugi, Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Oct. 2, 1981, Ser. No. 307,953

Claims priority, application Japan, Oct. 9, 1980, 55-141265; Oct. 9, 1980, 55-141266

Int. Cl.³ A04N *5/76*; G11B *27/02*

U.S. Cl. 358—335 5 Claims

1. An editing control apparatus for video tape recorders, comprising:

(A) means for sensing positions of video tapes installed in a recorder-VTR and a player VTR, respectively;

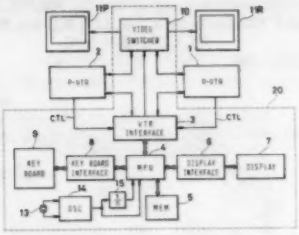
(B) means for memorizing data for positions of the video tapes obtained at said position sensing means;

(C) means for advancing video tapes of the recorder and player VTRs in synchronism to each other with reference to the memorized data for the respective video tapes;

(D) means for executing editing operations by recording video signals reproduced by said player-VTR on video tapes of said recorder-VTR from tape positions memorized in said data memorizing means;

(E) means for interrupting said video tape advancing operation by manually operating switching means;

(F) means for positioning respective video tapes to positions referenced by memorized data in said data memorizing means automatically and without manual intervention immediately after said interrupting means is actuated; and



(G) when said means for interrupting is actuated, said means for positioning including means for automatically moving the video tape of the recorder-VTR at high speed relative to normal playback speed to a predetermined position prior to a memorized position and means for then automatically advancing without further manual intervention the recorder-VTR video tape at the normal playback speed from said predetermined position to said memorized position.

4,428,002

SPECIAL EFFECTS VIDEO DISC REPRODUCING SYSTEM FOR ELIMINATING PICTURE FLICKER

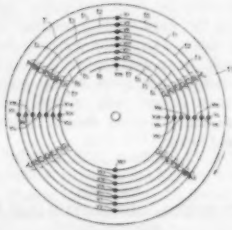
Atsumi Hirata, Fujisawa, Japan, assignor to Victor Company of Japan, Ltd., Yokohama, Japan

Filed Mar. 19, 1981, Ser. No. 245,456

Claims priority, application Japan, Mar. 19, 1980, 55-35618

Int. Cl.³ H04N *5/76*

U.S. Cl. 358—342 **4 Claims**



1. A special reproducing system in an apparatus for reproducing a rotary recording medium having a video signal recorded on a spiral track, said video signal being recorded in terms of two frames for each track turn of said rotary recording medium, the information content of said two recorded frames being the same in each one track turn, each of said frames comprising two fields,

said rotary recording medium having four vertical blanking period recording positions on each track turn of said rotary recording medium, and first or second reference signal having mutually different frequencies being recorded on a reference signal track between adjacent information tracks on said recording medium,

said first and second reference signals being alternately changed over and recorded on said reference signal track for each track turn of said rotary recording medium,

said rotary recording medium further having a third reference signal recorded at one of the vertical blanking period recording positions corresponding to a part of the track where said first and second reference signals are changed over,

said special reproducing system comprising:

a reproducing element for scanning over tracks on said rotary recording medium to reproduce recorded signals;

skipping means for shifting said reproducing element to skip to an adjacent track responsive to skip pulses; and

skip pulse supplying means for generating skip pulses corresponding to a mode for performing a special reproduction which is different from a normal reproduction, one of said skip pulses being generated for every revolution period of said rotary recording medium with a timing corresponding to the recorded positions of the vertical blanking periods of the recorded video signal,

means for supplying said skip pulses to said skipping means,

said skip pulse supplying means generating no skip pulses during a normal-speed reproduction mode so that said reproducing element scans over both of the two frames in one track turn with respect to each of the track turns of said rotary recording medium,

said skip pulse supplying means generating skip pulses for skipping said reproducing element at a vertical blanking period recording position opposing a position where said third reference signal is recorded in one track turn with respect to each of the track turns of said rotary recording medium during double-speed reproduction mode in the forward direction, so that said reproducing element scans over one of the two frames in one track turn with respect to each of the track turns,

said skip pulse supplying means generating skip pulses for skipping said reproducing element at two vertical blanking period recording positions other than the vertical blanking period recording positions recorded with and opposing said third reference signal in one track turn with respect to each of the track turns of said rotary recording medium upon triple-speed reproduction mode in the forward direction, and

said skip pulse supplying means generating skip pulses for skipping said reproducing element at three vertical blanking period recording positions other than the vertical blanking period recording position recorded with said third reference signal in one track turn with respect to each of the track turns of said rotary recording medium upon quadruple-speed reproduction mode in the forward direction.

4,428,003

PERIODICAL SIGNAL DETECTION CIRCUIT IN A REPRODUCING APPARATUS

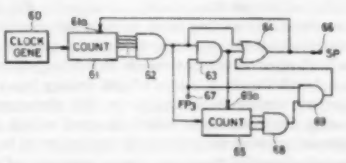
Hiroyuki Sugiyama, Isehara; Ryozo Abe; Masaki Sakurai, both of Yokohama, and Kenji Yoshihara, Chiba, all of Japan, assignors to Victor Company of Japan, Ltd., Yokohama, Japan

Filed Sep. 9, 1981, Ser. No. 300,672

Claims priority, application Japan, Sep. 9, 1980, 55-125108

Int. Cl.³ H04N *5/76*

U.S. Cl. 358—342 **6 Claims**



1. A periodic signal detection circuit in an apparatus which reproduces an information signal and a periodic signal from a recording medium recorded with the information and periodic signals, said periodic signal detection circuit comprising:

separation circuit means for separating said periodic signal from the reproduction signal;

reference pulse signal generating circuit means for generating a reference pulse signal having a repetition frequency which is the same as said periodic signal;

first gate circuit means for producing an output signal responsive to a coincidence of the periodic signal obtained from said separation circuit means and the reference pulse signal obtained from said reference pulse signal generating circuit means;

first counter means for producing an output responsive to counting N reference pulses of said reference pulse signals (N is an integer greater than or equal to 2);

second gate circuit means for passing the signal from said separation circuit means responsive to the output of said first counter means; and

output circuit means for passing said reference pulse signal, the output of said first gate circuit, and the output of said second gate circuit to constitute a detected periodic signal.

4,428,004

MAGNETIC TAPE SYSTEM FOR OPTIMALLY REPRODUCING STILL AND SLOW MOTION VIDEO PICTURES

Mineo Mino, Hirakata, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed May 5, 1981, Ser. No. 260,721
Claims priority, application Japan, May 9, 1980, 55-62073
Int. Cl.³ H04N 5/783
U.S. Cl. 360—10.2 **4 Claims**

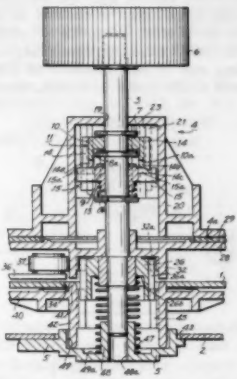
1. In a helical scanning VTR having a tape transport motor and rotating video reproducing heads, a control device comprising: a rotary phase detecting and generating means for detecting a rotary phase of said video heads and for generating a rotary phase pulse signal in response to said detached rotary phase; a first pulse detecting and generating means for detecting a low level portion of a reproduced signal from each of said video heads and for generating a first pulse signal which is indicative of the detection of said low level portion; a second pulse generating means connected to said rotary phase detecting means for frequency dividing said rotary phase pulse signal obtained from said detecting means by a factor of 1/2n so as to generate a second pulse signal having a pulse width of T_2; and a third pulse generating means connected to said rotary phase detecting means for frequency dividing said rotary phase pulse signal by a factor of 1/n so as to generate a third pulse signal having a pulse width of T_1; wherein said second pulse signal is fed to an amplifier where it is amplified and then fed to said tape transport motor; said device further comprising a phase comparator which is connected to said rotary phase detecting means and said first pulse generating means so that when the phase of said rotary phase pulse with the phase of said first pulse signal, an inhibit signal is fed to a gate means connected between said amplifier and said tape transport motor so as to inhibit said second pulse signal from being fed to said tape transport motor so as to thereby enable the reproduction of a still video picture, and further comprising a mixing and amplifying means for mixing and amplifying said second and third pulse signals and for supplying said mixed and amplified signals to said tape transport motor so as to thereby enable the reproduction of a slow motion video picture.

4,428,005

MODE SELECTING DEVICE FOR A VIDEO SIGNAL REPRODUCING APPARATUS

Yoshimi Kubo, Atsugi, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Oct. 6, 1981, Ser. No. 309,026
Claims priority, application Japan, Oct. 6, 1980, 55-139622
Int. Cl.³ H04N 5/76
U.S. Cl. 360—10.3 **22 Claims**



1. A device for selecting the mode of operation of an apparatus for reproducing information signals recorded on a record medium during movement of the latter, said device comprising:

rotation means adapted to rotate about an axis;

rotation detecting means for detecting the rotational speed and the angular position of said rotation means about said axis; and

latch means for maintaining said rotation means in one of a first and second axial position along said axis, the speed of movement of said record medium being controlled in response to the detection of said angular position when said rotation means is maintained in said first axial position and the speed of movement of said record medium being controlled in response to the detection of said rotational speed when said rotation means is maintained in said second axial position.

4,428,006

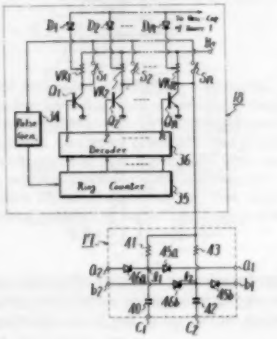
TELEVISION RECEIVER FOR RECEIVING SOUND MULTIPLEX SIGNALS

Yoshiaki Ohgawara, Inagi, and Hideaki Fujii, Kiyose, both of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Nov. 14, 1979, Ser. No. 94,233
Claims priority, application Japan, Nov. 20, 1978, 53-143058
Int. Cl.³ H04N 5/78, 5/44
U.S. Cl 360—33.1 **4 Claims**

1. A combination television receiver and video tape playback device comprising, a tuner in said receiver and tunable to any one of a plurality of TV channels carrying video and at least a first audio stereo signal as well as to a TV channel which is unused in the area of the TV receiver, said TV receiver having means for demodulating at least said first audio stereo signal, first switching means having first and second positions receiving said first audio stereo signal, a pair of speakers connected to said first switching means and receiving said first audio stereo signal when said first switching means is in said first position, said video playback device producing a second audio stereo signal which is supplied to said first switching means, and to said pair of speakers when said first switch is in said second position and means for controlling the tuning of said tuner connected to said first switching means,

wherein said video playback device produces a video signal and includes a modulation circuit for modulating said video signal on a TV channel which is unused in the area and supplies its output to said tuner, wherein said tuner is an electronic tuner, and a channel selection circuit is connected to said electronic tuner and to said first switching means to place it in said first position when said tuner is tuned to one of the plurality of TV channels and to place said first switching means in said second position when said tuner is tuned to said TV channel which is unused in the area, wherein said first switching means is an electronic switch, wherein said channel selection circuit has a first output lead connected to said electronic tuner, a plurality of different voltage developing means in said channel selection circuit and second switching means for selectively connecting one of said plurality of different voltage developing means to said first output lead, wherein said channel selection circuit has a second output lead which is connected to said first switching means and said second output lead connected to the one of said plurality of different voltage selecting means which causes said tuner to be tuned to said unused TV channel so as to switch said first switching means to its second position when said unused TV channel is tuned, and wherein said first switching means has a pair of output terminals, and first and second pairs of input terminals, a first pair of diodes, respectively, connected between said first pair of input terminals and said pair of output terminals, a second pair of diodes, respectively, connected between said second pair of input terminals and said pair of output terminals, a first resistor connected between said first output lead of said channel selection circuit and the junction point between first ones of said first and second pairs of diodes, and a second resistor connected between said first output lead and the junction point between second ones of said first and second pairs of diodes.



4,428,007

METHOD AND APPARATUS FOR DECODING DIGITAL DATA

Masato Tanaka, and Shunsuke Furukawa, both of Tokyo, Japan, assignors to Sony Corporation, Tokyo, Japan

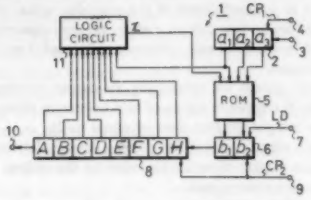
Continuation of Ser. No. 222,278, Jan. 2, 1981. This application Jul. 19, 1982, Ser. No. 399,244

Claims priority, application Japan, Dec. 28, 1979, 54-172532; Jan. 17, 1980, 55-3929

Int. Cl.³ G11B *5/09*

U.S. Cl. 360—44 **12 Claims**

1. A method of decoding digital data having transitions therein, wherein the separation between succeeding transitions represents a particular number of successive binary bits of a particular bit value, said method comprising the steps of measuring the separation between succeeding transitions; determining if the separation between two succeeding transitions is less than or greater than a predetermined amount substantially equal to the minimum separation between the first two transitions in data representing at least three successive binary bits of a first value, said minimum separation being greater than the maximum separation between succeeding transitions in data representing at least three successive binary bits of said first value; producing successive binary bits of said first value when said separation is determined to be less than said predetermined amount; and producing successive binary bits of a second value when said separation is determined to be greater than said predetermined amount.



4,428,008

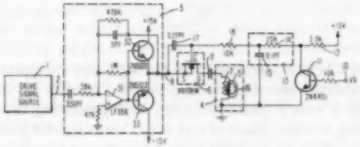
ELECTRONIC SWITCHING CIRCUIT FOR USE IN MAGNETIC HEAD DRIVES

John S. Fawkes, San Jose, Calif., assignor to Ampex Corporation, Redwood City, Calif.

Filed Apr. 2, 1982, Ser. No. 364,692

Int. Cl.³ G11B *15/12*

U.S. Cl. 360—61 **13 Claims**



1. A circuit for switching a driving current applied to a magnetic transducer, comprising:

a magnetic transducer having a magnetic core with poles forming a transducing gap and transducing windings wound around said magnetic core;

a driving signal source coupled to supply said driving current to said transducing windings; and

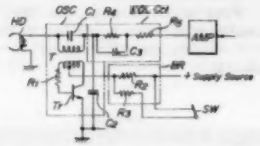
an electronic switching means having an input coupled to said output of said driving signal source, having an output coupled to said transducing windings and having a control input coupled to receive a substantially linearly changing D.C. control signal in a first or second direction, respectively, said switching means having an internal resistance value which changes substantially linearly in response to said D.C. control signal changing in a first direction from a high resistance value corresponding to an open state of said switching means when said driving current is disconnected from the transducing windings to a low resistance value corresponding to a closed state of said switching means when said driving current is connected to the transducing windings and conversely, said internal resistance value of said switching means changes substantially linearly in response to said D.C. control signal changing in a second direction from said low resistance value to said high resistance value, respectively.

4,428,009

SUPERMINIATURE TAPE RECORDER

Shinichi Saitou, and Masatoshi Ida, both of Hachioji, Japan, assignors to Olympus Optical Company Limited, Tokyo, Japan

Continuation of Ser. No. 154,538, May 30, 1980, which is a continuation of Ser. No. 926,208, Jul. 19, 1978, abandoned. This application Apr. 6, 1982, Ser. No. 365,888
Claims priority, application Japan, Jul. 20, 1977, 52-87529
Int. Cl.³ G11B 5/45, 15/46
U.S. Cl. 360—65 7 Claims



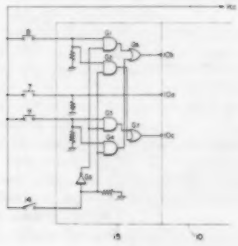
1. A tape recorder having a tape speed changing mechanism comprising a motor, a magnetic head, an oscillation circuit connected to the head, an equalizing circuit connected to the oscillation circuit, said equalizing circuit having a capacitor for bypassing a high frequency component to ground, a signal amplifier circuit connected to the equalizing circuit, a speed changing circuit connected to the motor for changing the speed of the motor, and a switch connected to ground for energizing the speed changing circuit through a conductive current path in the switch, said capacitor being groundable through the same conductive current path in the switch.

4,428,010

DRIVE MODE SWITCHING DEVICE FOR MAGNETIC TAPE RECORDER/REPRODUCER

Reisuke Sato, and Shizuo Ando, both of Saitama, Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan

Filed Aug. 25, 1981, Ser. No. 295,964
Claims priority, application Japan, Aug. 27, 1980, 55-116965
Int. Cl.³ G11B 15/18
U.S. Cl. 360—73 9 Claims



1. In an automatic reverse type magnetic tape recorder/reproducer of the type having a normal/reverse direction control means for controlling the direction of travel of said tape at normal speed, a normal direction fast speed control means for causing said tape to travel at a fast speed in the normal direction, and a reverse direction fast speed control means for causing said tape to travel at a fast speed in the reverse direction, the improvement comprising:

a manually actuable fast-forward button;

a manually actuable rewind button;

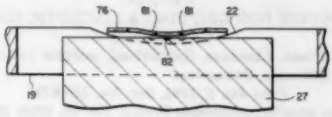
switching means comprising first means responsive to said tape traveling in said normal direction and (i) to the actuation of said fast-forward button for actuating said normal direction fast speed control means, and (ii) to the actuation of said rewind button for actuating said reverse direction fast speed control means, and second means responsive to said tape traveling in said reverse direction and (i) to the actuation of said fast-forward button for actuating said reverse direction fast speed control means, and (ii) to the actuation of said rewind button for actuating said normal direction fast speed control means.

4,428,011

VENTED MAGNETIC TAPE READ HEAD

Paul A. Gilovich, Saratoga, and James S. Toreson, Mountain View, both of Calif., assignors to Microcomputer Systems Corporation, Sunnyvale, Calif.

Division of Ser. No. 151,394, May 19, 1980, Pat. No. 4,354,211. This application Apr. 16, 1982, Ser. No. 369,205
Int. Cl.³ G11B 5/60, 5/08
U.S. Cl. 360—102 4 Claims



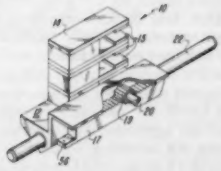
1. A magnetic tape apparatus comprising a drum, means for supporting and rotating said drum, at least one transducer extending past the surface of said drum adapted to rotate therewith in a given plane, means for moving said transducer longitudinally along said drum, means for presenting tape to said drum with its longitudinal axis parallel to said plane, means adjacent said transducer for venting air from the air cushion between the rotating drum and the tape at the region of the transducer to bring the tape closer to the face of the transducer and at least one groove formed on the face of the transducer for venting air from the cushion between the transducer and tape.

4,428,012

METHOD AND APPARATUS FOR STORING AND RETRIEVING INFORMATION

Roy A. Applequist, Windsor, Calif.; Richard M. Altobellis, Jamestown, Colo.; Glade N. Bagnell, Louisville, Colo.; Robert F. Hoppe, Longmont, Colo.; James O. Jacques, Boulder, Colo., and Terry G. Johnson, Longmont, Colo., assignors to MiniScribe Corporation, Longmont, Colo.

Filed May 4, 1981, Ser. No. 260,495
Int. Cl.³ G11B 5/55, 21/08
U.S. Cl. 360—106 15 Claims



1. Apparatus for positioning at least one interactive head relative to at least one disk member, the positioning apparatus comprising:

a common carriage member connected to said at least one head in supporting relationship, the carriage member being operably connected in a fixed manner to the interactive head;

a single guide shaft operably coupled to said common car-

riage member and supporting the carriage member for linear movement therealong;

a gear rack positioned along one surface of said common carriage member and extending in a direction parallel to the guide shaft;

a drive motor having a rotatable motor shaft positioned adjacent the gear rack;

a pinion gear carried on the motor shaft for engaging said gear rack; and

biasing means bearing upon said common carriage member for urging the carriage member to pivot about said guide shaft, thereby preloading said gear rack into substantially lash free engagement with the pinion gear;

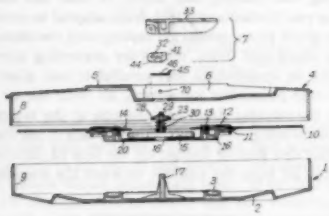
whereby the drive motor linearly drives said carriage member along the guide shaft, with the gear rack and pinion gear preloaded to maintain lash free, positive engagement as a result of the biasing means urging the carriage member around the guide shaft to thus avoid disengagement of the gear teeth and to compensate for wear.

4,428,013

DEVICE FOR GRIPPING A MAGNETIC DISK CARTRIDGE

Patrick Posso, Lausanne, Switzerland, assignor to GEFITEC S.A., Lausanne, Switzerland

Filed Jul. 6, 1981, Ser. No. 280,879
Claims priority, application France, Jul. 16, 1980, 80 15687
Int. Cl.³ G11B *23/02*; B65D *85/30*
U.S. Cl. 360—133 **5 Claims**



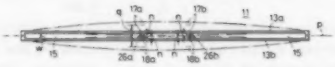
1. For use with a magnetic disc cartridge of the type which comprises a container, a lid, and a magnetic disc assembly, said disc assembly defining a central cavity containing a magnetic disc held between a clamping plate and a locking plate, said container including a base having magnet means for removable connection with said disc assembly, said disc assembly including an extractor plate movably mounted between said clamping and locking plates, said extractor plate including at least one rod projecting through said disc, said rod including a spindle extending parallel to said disc, and spring means biased between said extractor plate and said spindle, the improvement which comprises a device for carrying, extracting, and reclosing said cartridge, said device comprising a handle, a pivot piece of resilient material pivotedly received in said handle, a pawl movably mounted on said handle, said pawl being shiftable between a first position whereat said pawl and handle are coupled for conjoint movement and a second position whereat said pawl and handle are relatively pivotal, a clearance slot generally in the configuration of an inverted L formed in said pivot piece, said slot including an open entrance end and a blind end defining a bearing, said handle including a clearance opening aligned with said entrance end of said clearance slot, a constricted portion formed in said slot adjacent said bearing, the cross sectional extent of said constricted portion in the unstressed condition thereof being less than the cross sectional dimension of said spindle, whereby said spindle may be removably retained in said bearing by forcibly urging said spindle through said constricted portion and into said bearing, a first stop surface formed on said pivot piece and disposed a first distance from the axis of said bearing, a second stop surface formed on said pivot piece and disposed a second and greater distance from said axis of said bearing, said extractor plate being shifted to releasing position of said container when said spindle is in said bearing and said second stop surface engages said lid and being in locking position of said container when said first stop surface engages said lid, said spring means yieldably maintaining said lid against the stop surface engaging said lid.

4,428,014

CASE FOR A ROTARY RECORDING MEDIUM

Takashi Saito, Ayase, Japan, assignor to Victor Company of Japan, Ltd., Yokohama, Japan

Filed Sep. 9, 1981, Ser. No. 300,671
Claims priority, application Japan, Sep. 9, 1980, 55-125109
Int. Cl.³ G11B *23/02*
U.S. Cl. 360—133 **8 Claims**



1. A case for a rotary recording medium comprising:

a jacket having a space for accommodating a rotary recording medium and an elongated opening on one end of said jacket through which the rotary recording medium can enter and leave said jacket; and

a lid member for closing said opening of said jacket,

said elongated opening being defined by longer sides and shorter sides,

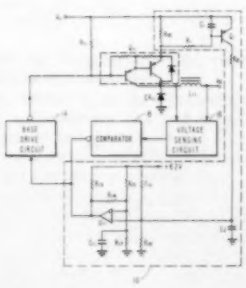
said jacket having projecting parts crossing said elongated opening by extending between the longer sides of said elongated opening.

4,428,015

OVERCURRENT LIMITER CIRCUIT FOR SWITCHING REGULATOR POWER SUPPLIES

John J. Nesler, Los Angeles, Calif., assignor to Hughes Aircraft Company, El Segundo, Calif.

Filed Dec. 22, 1981, Ser. No. 333,356
Int. Cl.³ H02H *3/08*
U.S. Cl. 361—18 **10 Claims**



1. In a switching regulator power supply having a switching transistor for delivering power to a load connected to an output terminal thereof and control means for activating and deactivating said transistor on receipt of predetermined input signls; a circuit for controlling the switching transistor to limit the current therethrough whenever the load is substantially overloaded, said circuit comprising:

first means for sensing the current through said switching transistor, including a current sensing resistor for developing a first voltage in response to the current through the switching transistor, said current sensing resistor being

connected between a source of electrical energy and a terminal of the switching transistor and filter means for mitigating the effects of switching regulator transients, said filter means being connected to

second means for providing to said control means a control signal whenever the current through said switching transistor exceeds a predetermined threshold, said second means including a current generator having a bipolar transistor biased for nominal operation in its active mode and being responsive to the current sensed in the switching transistor, means for developing a second voltage signal relative to ground level in response to the output of the current generator, and a threshold detector for comparing the second developed voltage to a reference potential and to generate said control signal to said control means to deactivate the switching transistor whenever the sensed current exceeds a predetermined threshold.

4,428,016

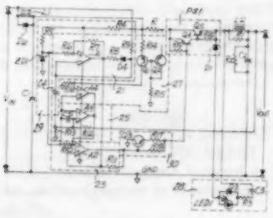
OVERLOAD PROTECTED SWITCHING REGULATOR

Robert G. Brasfield, Seattle, Wash., assignor to The Boeing Company, Seattle, Wash.

Continuation-in-part of Ser. No. 212,235, Dec. 2, 1980, abandoned. This application May 29, 1981, Ser. No. 268,242

Int. Cl.³ H02H *3/08, 7/20*

U.S. Cl. 361—18 **22 Claims**



1. An overload protected switching regulator for regulating the level of voltage supplied to a load by a DC voltage source, said overload protected switching regulator comprising:

a power switch connected to control the flow of current between a DC voltage source and the output of said regulator, the open/closed ratio of said power switch determining the DC output voltage of said regulator;

a single bistable control circuit having a first input for receiving close command signals and a second input for receiving open command signals, said single bistable control circuit coupled to said power switch for controlling the open/-closed state of said power switch in response to said open and close command signals;

oscillation means including a repetition rate oscillator for producing close command signals at a predetermined frequency, said close command signals produced by said repetition rate oscillator being applied to said first input of said single bistable control circuit;

voltage detection means for detecting the output of said regulator and normally producing an open command signal after said repetition rate oscillator has produced a close command signal, said open command signals produced by said voltage detection means being applied to said second input of said single bistable control circuit, the time interval between each close command signal produced by said repetition rate oscillator and the subsequent open command signal produced by said voltage detection means controlling the level of the output voltage of said regulator; and,

current limit detection means for sensing at a point located between said DC voltage source and said power switch the magnitude of current flow through said power switch and producing an open command signal when said power flow reaches a predetermined level, said open command signals produced by said current limit detection means also being applied to said second input of said single bistable control circuit.

4,428,017

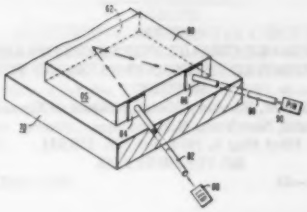
ELECTRIC MOTOR AND TRANSFORMER LOAD SENSING TECHNIQUE

Eugene G. Vaerewyck, Pittsburgh, and Arthur E. Anderson, Murrysville, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Division of Ser. No. 158,108, Jun. 10, 1980, Pat. No. 4,363,061. This application Aug. 27, 1982, Ser. No. 412,368

Int. Cl.³ H02H *7/08*

U.S. Cl. 361—31 **1 Claim**



1. Apparatus for monitoring the current flow in an electrical load, comprising,

a Faraday rotator optical sensor means including:

an optical element operatively coupled to said electrical load;

an input optical fiber means and an output optical fiber means each contacting a first surface of said optical element;

a light reflective coating disposed on an opposite surface of said optical element;

a light energy polarizing element intimately coupling said input optical fiber means and said optical element;

a light energy analyzer element intimately coupling said output optical fiber and said optical element;

a light energy means for introducing light energy through said input optical fiber means and said light energy polarizing means into said optical element, said optical element rotating the polarized light in response to changes in the magnetic field caused by changes in the current flow in said electrical load, said light reflective coating reflecting said polarized light energy through said light energy analyzer means; and

signal processing circuit means coupled to said output optical fiber means at a location remote from said light analyzer means to manifest the current flow in said electrical load in response to the rotation of the polarized light energy by said optical element.

4,428,018

LOW LEAKAGE FILTERED POWER SUPPLY

Steven Hahn, East Hampton, N.Y., assignor to High Stoy Technological Corporation, Lake Success, N.Y.

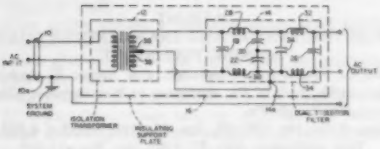
Filed Jan. 5, 1982, Ser. No. 337,112

Int. Cl.³ H02H *9/08*

U.S. Cl. 361—42 **3 Claims**

1. In an AC power supply system having a transformer structure that includes primary and secondary windings and a core, and a filter structure including capacitors and inductors, wherein said filter structure has an electrical center which is normally connected to system ground, the improvement for reducing leakage current with respect to system ground comprising a center tap on said secondary transformer winding connected to said electrical center of said filter structure, said

transformer and filter structures being electrically isolated from system ground, in which said filter structure includes a



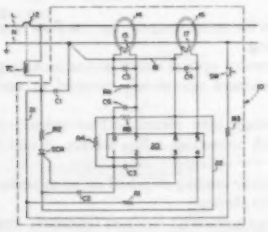
conductive housing which is electrically connected to said center tap.

4,428,019

GROUND FAULT CIRCUIT INTERRUPTING DEVICE WITH IMPROVED INTEGRATED CIRCUIT POWER SUPPLY

Edward K. Howell, Simsbury, Conn., assignor to General Electric Company, New York, N.Y.

Filed May 4, 1981, Ser. No. 260,511
Int. Cl.³ H02H 3/33
U.S. Cl. 361—45 **5 Claims**



1. An integrated circuit for utilization in a ground fault circuit interrupting device including a differential current transformer having a secondary winding in which is developed a fault signal proportional to any imbalance in the currents flowing in the line and neutral conductors of an AC power distribution circuit occasioned by a line-to-ground fault, a neutral transformer having a primary winding which is driven to develop a differential transformer imbalancing current in the neutral conductor if faulted to ground through a desensitizing low impedance, separable contacts for interrupting at least the line side of the distribution circuit, a trip solenoid, a thyristor operating when triggered into conduction to draw activating current through the solenoid to initiate separation of the contacts, an integrating capacitor and an energy storage filter capacitor, said integrated circuit comprising, in combination:

A. a differential amplifier having a first input connected with the differential current transformer secondary winding for amplifying a fault signal developed therein by a current imbalance exceeding a pre-selected threshold level established by a bias voltage applied to a second amplifier input, said amplifier developing an integrating capacitor charging current of a magnitude exponentially related to the fault signal magnitude;

B. an oscillator connected to drive the primary winding of the neutral transformer;

C. a comparator for sensing the voltage developing across the integrating capacitor;

D. a thyristor gate driver controlled by said comparator for producing gate pulses to trigger the thyristor into conduction when the voltage across the integrating capacitor achieves a pre-established reference level; and

E. a power supply connected across the line and neutral conductors and including

(1) a first regulated supply voltage section,

(2) a second supply voltage section connected with the filter capacitor,

(3) a first diode conducting half-wave rectified line current to said first section from the AC distribution circuit; and

(4) a second diode conducting half-wave rectified line current from said first section to said second section,

(5) whereby said first section develops a regulated half-wave rectified supply voltage and said second section develops an essentially full-wave rectified supply voltage,

(6) said second section connected to apply DC supply voltage to said amplifier and charging current to the integrating capacitor on a full-wave basis, and

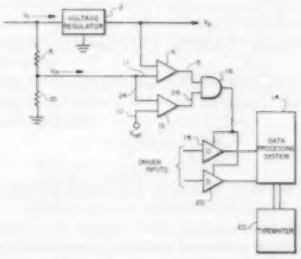
(7) said first section connected to apply DC supply voltage to said oscillator and comparator on a half-wave basis.

4,428,020

POWER SUPPLY SENSING CIRCUITRY

Raymond A. Blanchard, Jr., Freeville, N.Y., assignor to SCM Corporation, New York, N.Y.

Filed Oct. 14, 1981, Ser. No. 311,225
Int. Cl.³ H02H 3/20, 3/24
U.S. Cl. 361—90 **7 Claims**



1. Power supply sensing circuitry for a data processing system comprising:

a first comparator for comparing the power supply potential at the input to a voltage regulator with the output voltage from the voltage regulator, and for producing a signal when the supply voltage exceeds the output volage by a predetermined amount;

a second comparator for comparing the power supply potential with a reference voltage and for producing a signal when the power supply potential is at least the voltage required to operate the data processing system;

driver means for providing voltages to the data processing system; and,

means for enabling the driver means when a said signal is produced by both the first comparator and the second comparator.

4,428,021

CURRENT MONITORING APPARATUS

Wen T. Chen, West Newton, and Vincent C. Oxley, Waltham, both of Mass., assignors to GTE Laboratories Incorporated, Waltham, Mass.

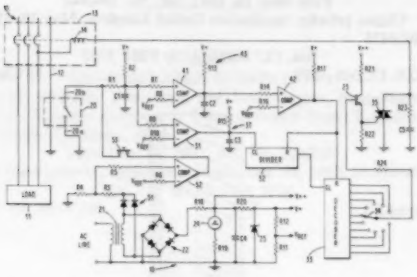
Filed Aug. 6, 1982, Ser. No. 405,818
Int. Cl.³ H02H 9/02, 3/00
U.S. Cl. 361—94 **18 Claims**

1. Current monitoring apparatus for monitoring current flow in a power supply line comprising

current sensing means operable to be coupled to a power supply line, said current sensing means having a pair of terminals and a switch connected therebetween and being

operable to alternately close and open the switch between the terminals at a predetermined frequency while the electrical current flowing in the power supply line exceeds a predetermined level;

pulse producing means coupled to the terminals of said current sensing means for producing switching pulses at said predetermined frequency in response to the closing



and opening of said switch at said predetermined frequency; and

counting means coupled to said pulse producing means for counting switching pulses therefrom and being operable to produce an output signal at an output terminal in response to counting a selected predetermined number of switching pulses from said pulse producing means.

4,428,022

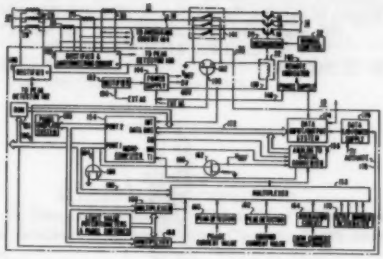
CIRCUIT INTERRUPTER WITH DIGITAL TRIP UNIT AND AUTOMATIC RESET

Joseph C. Engel, Monroeville, and Bernard J. Mercier, Pittsburgh, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Continuation of Ser. No. 140,625, Apr. 15, 1980, abandoned. This application Jun. 2, 1982, Ser. No. 383,926

Int. Cl.³ H02H *3/093*

U.S. Cl. 361—96 **7 Claims**



1. Circuit interrupter apparatus, comprising:

interrupter means for conducting current flow through an associated circuit and for operating to interrupt current flow therethrough on command;

sensing means for sensing current flow through said interrupter means;

microcomputer trip means comprising a microcomputer executing instructions in a predetermined sequence and connected to said interrupter means and said sensing means for comparing current flow through said interrupter means to a predetermined time-current trip characteristic and for operating said interrupter means whenever current flow therethrough exceeds said time-current trip characteristic, said microcomputer trip means comprising a TRIP output control line connected to said interrupter means, said TRIP output control line being operable by said microcomputer trip means from an inactive to an active state to command said interrupter means to interrupt current flow;

a power supply connected to said microcomputer trip means; and

interlock means connected to said power supply and to said TRIP output control line for maintaining said TRIP output control line in said inactive state following energization of said power supply until such time as operating power to said microcomputer is sufficient to enable said microcomputer trip means to execute positive control over said TRIP output control line.

4,428,023

ELECTRONIC PROTECTIVE CIRCUIT

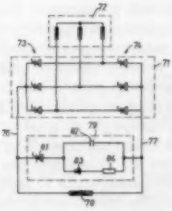
Franz Maier, Wettingen, Switzerland, assignor to BBC Brown, Boveri & Company Limited, Baden, Switzerland

Continuation of Ser. No. 232,513, Feb. 9, 1981, abandoned. This application Nov. 1, 1982, Ser. No. 438,242

Claims priority, application Switzerland, Feb. 25, 1980, 1464/80

Int. Cl.³ H02H *7/10*

U.S. Cl. 361—100 **5 Claims**



1. An electronic protective circuit for interrupting the current flowing from an alternating-current supply through a rectifier circuit equipped with controlled valves to an inductive load and for deenergizing said inductive load, comprising:

an extinguishing circuit;

at least one switching thyristor arranged between the alternating-current supply and the inductive load with which there is connected in parallel the extinguishing circuit;

said extinguishing circuit containing an extinguishing thyristor and a capacitor connected in series with the extinguishing thyristor; and

a deenergization circuit connected to terminals of the inductive load and comprising a resistor and controlled valve connected in series, wherein said deenergization circuit and said extinguishing circuit contain a common current path, in which the extinguishing thyristor is simultaneously used as said controlled valve for the deenergization circuit and wherein the remaining circuit of the deenergization circuit contains a diode which is poled in series with the extinguishing thyristor.

4,428,024

ELECTRONIC DOOR LOCKING SYSTEM FOR AN AUTOMOTIVE VEHICLE

Haruo Mochida, and Ken Miyamoto, both of Yokohama, Japan, assignors to Nissan Motor Company, Ltd., Kanagawa, Japan

Filed Apr. 7, 1982, Ser. No. 367,037

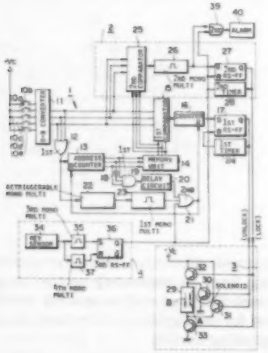
Claims priority, application Japan, Apr. 8, 1981, 56-49561[U]

Int. Cl.³ H01H *47/00*

U.S. Cl. 361—172 **7 Claims**

1. An electronic door locking system for an automotive vehicle for locking or unlocking vehicle doors without an ignition key which comprises:

(a) a plurality of switches for outputting at least one predetermined door-locking octal coded digit and a sequence of predetermined door-unlocking octal coded digits;
(b) a octal-binary code converter connected to a plurality of said switches for converting the octal coded digits inputted from said switches into the corresponding binary coded digits;
(c) an address counter connected to said octal-binary code converter for counting up a plurality of the binary-coded signals outputted from said octal-binary code converter whenever one of said switches is depressed and outputting an address-designation signal in response to the number of signals outputted from said octal-binary code converter;
(d) a memory unit connected to said address counter for outputting a previously stored binary coded signal in response to the address-designation signal outputted from said address counter;
(e) a first comparator connected to said octal-binary code converter and said memory unit for outputting a signal when one of the binary coded door-unlocking signals outputted from said octal-binary code converter agrees with one of the binary coded door-unlocking signals outputted from said memory unit in response to the respective address-designation signal outputted from said address counter;
(f) a counter connected to said first comparator for outputting a signal when said first comparator outputs the predetermined number of binary coded signals;



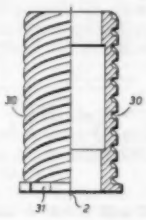
(g) a first reset-set flip-flop connected to said counter for outputting a door unlocking command signal when said counter outputs the signal;
(h) a second comparator connected to said octal-binary code converter and said memory unit for outputting a signal when at least one binary coded door-locking signal outputted from said octal-binary code converter agrees with at least one binary coded door-locking signal outputted from said memory unit in response to the address-designation signal outputted from said address counter,
(i) a second reset-set flip-flop connected to said second comparator for outputting a door locking command signal when said second comparator outputs the signal; and
(j) a door lock/unlock actuating solenoid connected to said first and second reset-set flip-flops for unlocking the vehicle doors when said first reset-set flip-flop is set and locking the vehicle doors when said second reset-set flip-flop is set; and
(k) means for detecting the presence of the ignition key left in an ignition keyhole and outputting a reset signal to said second reset-set flip-flop to inhibit the door-lock command signal from being inputted from said second reset-set flip-flop to said door lock/unlock actuating solenoid;
whereby the vehicle doors cannot be locked even when at least one predetermined door-locking octal coded digit is inputted to the system via a plurality of said switches, in the case where the ignition key is left inserted in the ignition keyhole.

4,428,025

COOLING ARRANGEMENTS

David R. King, Chelmsford, England, assignor to English Electric Valve Company Limited, Chelmsford, England

Filed May 18, 1981, Ser. No. 264,422
Claims priority, application United Kingdom, May 19, 1980, 8016435
Int. Cl.³ H01G *1/08*; F28F *1/40*
U.S. Cl. 361—274 **13 Claims**



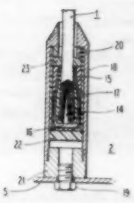
13. A cooling arrangement including:
an expandable tubular bellows having a convoluted wall presenting an inner surface;
an elongate deflector means mounted within said bellows; and
means for admitting a fluid coolant flow into the region between the inner surface of said convoluted wall of said bellows and said deflector means;
said deflector means being arranged to deflect the coolant flow into the convolutions of said convoluted wall to prevent heat build-up in said convoluted wall.

4,428,026

TWO LAYER PROBE

Frederick L. Maltby, Jenkintown; Kenneth M. Loewenstern, Warminster, and Jack G. Benning, Jr., Lansdale, all of Pa., assignors to Drexelbrook Controls, Inc., Horsham, Pa.

Division of Ser. No. 72,833, Sep. 6, 1979, Pat. No. 4,301,681.
This application Nov. 20, 1981, Ser. No. 323,317
Int. Cl.³ G01F *23/26*; H01G *7/00*
U.S. Cl. 361—280 **19 Claims**



10. A probe for the measurement of the level of conductive materials within a vessel having conductive wall portions comprising a probe member, an upper termination and a lower termination, said probe member comprising a conductive core covered by an insulating layer and further covered by an outermost continuous semi-conducting layer, said conductive core being electrically insulated from said conductive materials, said upper termination including means for attachment to said semi-conducting layer so as to provide physical support of said probe while maintaining electrical isolation of said core and said semi-conducting layer from said vessel, said upper

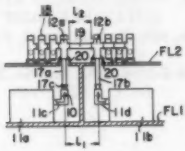
termination also including means for electrical connection of said core to an electrical terminal adapted to be connected to sensor circuitry for providing a signal representative of the level of said conductive materials within said vessel, and said lower termination maintaining electrical isolation of said core and of said semi-conductive layer from said vessel.

4,428,027

GAS-INSULATED SUBSTATIONS

Satoshi Ohyama, Yokohama, and Isao Kamata, Sagamihara, both of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kanagawa, Japan

Filed Dec. 10, 1981, Ser. No. 329,515
Claims priority, application Japan, Dec. 18, 1980, 55-178004
Int. Cl.³ H02B *1/04, 7/06*
U.S. Cl. 361—333 **5 Claims**



1. In a gas-insulated substation of the type comprising a plurality of transformers parallelly arranged on a first floor, gas-insulated switching apparatus disposed on a second floor at a level different from that of said first floor, said switching apparatus including disconnecting switches, branch bus-bars extending vertically from lead boxes of said transformers, and main bus-bars interconnecting said transformers through said branch bus-bars, the improvement in which said lead boxes of at least two of said transformers project from facing sides of the respective transformers arranged side by side, said branch bus-bars connected to said lead boxes extend parallelly with each other and are connected to said disconnecting switches, and each of said main bus-bars interconnects said disconnecting switches so that a length of said main bus-bar is made to be substantially equal to a distance between said lead boxes projecting from the respective transformers.

4,428,028

ELECTROLYTIC CAPACITOR

Sidney D. Ross, and Franz S. Dunkl, both of Williamstown, Mass., assignors to Sprague Electric Company, North Adams, Mass.

Continuation-in-part of Ser. No. 774,010, Mar. 3, 1977, abandoned. This application Nov. 12, 1981, Ser. No. 320,637
Int. Cl.³ H01G *9/02*
U.S. Cl. 361—433 **1 Claim**

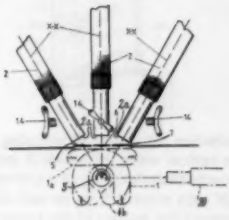
1. An electrolytic capacitor comprising two contiguously wound electrode foils separated by interleaved spacers, at least one of said electrode foils bearing a barrier layer oxide, in contact with an electrolyte consisting essentially of as solvent a member of the group consisting of 3-methoxypropionitrile and mixtures with ethylene glycol, ethylene glycol monomethyl ether, and ethylene glycol monoethyl ether and sufficient solute chosen from the group consisting of tris(triethylammonium) trimethyltetraphosphate, tributylamine salt of glycol-borate, and diisopropylammonium boro-di-2,2'-dihydroxybiphenyl to provide a resistivity at 25° C. of at most 1000 ohm-cm and a maximum formation voltage of 300 to 500 V.

4,428,029

LIGHT GATHERING DEVICE FOR TRANSMITTING LIGHT FROM A FLASH TO AN OPTICAL FIBER BUNDLE FOR PHOTOGRAPHING SMALL OBJECTS, AND DEVICE INCORPORATING SAME

Mardick Baliozian, Feucherolles, France, assignor to BALCAR, Paris, France

Filed Jan. 19, 1982, Ser. No. 340,693
Claims priority, application France, Jan. 30, 1981, 81 01804
Int. Cl.³ G03B *15/02*
U.S. Cl. 362—12 **13 Claims**



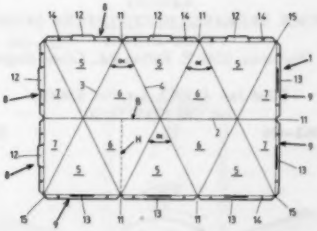
1. A light gathering device for taking photographic pictures of small objects, which comprises a first inner housing (8) having an open side permitting the insertion of a flash (1, 1*a*, 1*b*) of an electronic flash unit into an inner chamber of said housing (8), a said flash in said inner chamber, adapted continuously to emit light, said first housing (8) being surrounded by a second outer housing (22) having at least one opening (12) through its wall for receiving the input end (2*a*) of at least one bundle of optical fibers (2), the other end of the bundle constituting a light source for illuminating the object to be photographed, and means (5, 6, 7) for adjusting the intensity of the light received by said input end of said optical fiber bundle (2).

4,428,030

MODULAR LIGHT-DIFFUSING OR REFLECTING PLASTIC PANEL

Mardick Baliozian, Larchmont, N.Y., assignor to Tekno AG, Zurich, Switzerland

Filed Oct. 25, 1982, Ser. No. 436,450
Claims priority, application France, Oct. 23, 1981, 81 19898
Int. Cl.³ G03B *15/02*
U.S. Cl. 362—18 **9 Claims**

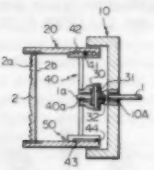


1. A modular light-diffusing or reflecting plastic panel for photographic, motion picture and television applications, having a polygonal contour, comprising semi-rigid plastic material having therein a plurality of pressed grooves (2, 3, 4, 39, 41) extending along crossed lines interconnecting two opposite sides of the panel and dividing said panel into at least one row of alternately oppositely disposed triangles and securing means along the panel periphery for connecting the panel to at least another similar panel (1) or to an accessory (10, 16, 18, 19, 21, 27, 33, 34).

4,428,031
ILLUMINATION DEVICE

Kei Mori, 3-16-3-501, Kaminoge, Setagaya-ku, Tokyo, Japan

Filed Dec. 30, 1981, Ser. No. 335,625
Claims priority, application Japan, Jan. 4, 1981, 56/240
Int. Cl.³ F21V 7/04
U.S. Cl. 362—32 6 Claims



1. An illumination device for illuminating the interior of a room with an optical wave guide which transmits light rays from a light source therethrough and a convex Fresnel lens for refracting light rays emitted from an exit end of said optical wave guide toward the interior of the room, said illumination device comprising:

a base member for an optical wave guide having a first aperture for introducing therein said optical wave guide serving as the light source;

a cylinder member facing said base member and having a holding member with a joint member and having said convex Fresnel lens therein, said holding member positioned near said base member, and said convex Fresnel lens being positioned apart from said base member, said cylinder member, holding member and convex Fresnel lens being aligned with each other; and

said holding member having a second aperture to which is attached said exit end of the optical wave guide and which is connected to said base member by means of said joint member, said convex Fresnel lens being spaced from and aligned with said exit end of the optical wave guide so as to refract light rays emitted from said exit end, and said cylinder member includes means for displacing said cylinder member with respect to said holding member so that the distance between said end portion of the optical wave guide and said Fresnel lens is displacable within a range not longer than the focal length of said convex Fresnel lens.

4,428,032
QUICK RELEASE LIGHT FIXTURE GLOBE CONNECTOR

James R. Workman, 4140 E. Fulton Rd., Grand Rapids, Mich. 49506

Filed Jan. 4, 1982, Ser. No. 336,698
Int. Cl.³ F21V 33/00
U.S. Cl. 362—96 32 Claims

1. A light fixture globe connector, comprising:

an extender for positioning electrical leads;

a resilient clip positioned by said extender, having a plurality of clamping arms, each of said arms having a recurved portion;

a light socket positioned by said extender and oriented to allow for operable connection to electrical leads;

a light fixture globe having an indented attachment portion and a central axis;

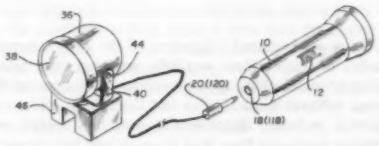
a containing piece movably mounted on said extender and having an inwardly extending perimeter;

wherein, said containing piece can be moved so as to contain and encompass said clip and engage said clamping arms, said containing piece engaging and urging said recurved portions of the clamping arms to fixedly engage and support said globe indented attachment portion, and said recurved portions of the clamping arms being biased into engagement with said inwardly extending perimeter of said containing piece whereby said containing piece is restrained from moving.

4,428,033
FLASHLIGHT HAVING TEST LEADS AND A SECOND, REMOTE, MAGNETICALLY ATTACHABLE ROTATABLE LAMP

Scott T. McBride, 559 Chestnut Street, P.O. Westwood, N.J. 07675

Filed Jul. 14, 1982, Ser. No. 398,388
Int. Cl.³ F21L 7/00
U.S. Cl. 362—183 11 Claims



1. A flashlight characterized as having a socket means for selectively and removably supplying electrical energy to a remotely disposed and connected lamp and/or continuity tester, said flashlight including;

(a) a flashlight case of conventional configuration and having a switch on the exterior of said case for supplying and connecting battery power from an enclosed battery source to one side of a first bulb carried within said case, the other side of this first bulb connected to said battery source and actuated only by said switch;

(b) a socket disposed and carried by said case and electrically and independently connected to both poles of the battery source, said socket disposed in that end of the flashlight case opposite the end in which the first bulb is carried, this socket providing contact means within the socket and in mounted condition providing electrical contacting means within the flashlight case to provide electrical energy from both sides of the battery source and independent of other connecting means to the same battery source and so that said electrical contacting means is insulated from random exterior contact;

(c) a plug insertable in and removable from said socket and when inserted in said socket said inserted plug engaging the contacting means in the socket and supplying conducting means from both poles of said battery source and carrying this electrical battery power to a second bulb disposed remotely from said flashlight case and/or to a continuity tester;

(d) a pair of flexible conductors extending from said plug to either a remote housing and said second bulb therein or to a continuity tester or to an interposed conductor, the insertion of said plug in said socket effecting a conducting path to said battery source so as to light this second bulb, or through an interposed continuity tester and conductors,

or to a continuity tester disposed to only illuminate the first bulb and absent actuation of switch when continuity is established, and

(e) a magnetic device providing a base secured to a bracket which pivotally supports and retains said remote housing and the second bulb therein and maintains said housing in a selected adjusted position so that the lighted second bulb directs the light therefrom to a selected area.

4,428,034
LIGHT BULB MOUNTING UNIT

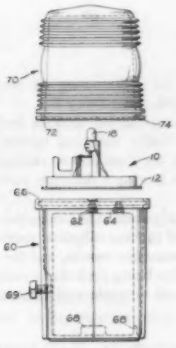
Anthony J. Seller, Feckenham, England, assignor to Tildawn Electronics Ltd., England

Filed Dec. 14, 1982, Ser. No. 449,723

Claims priority, application United Kingdom, Dec. 17, 1981, 8138149

Int. Cl.³ F21V *7/00*

U.S. Cl. 362—186 **7 Claims**



1. A lamp comprising a housing for reception of a battery, and a lens body mounted on the housing for rotation relative thereto, wherein the improvement comprises a bulb holder unit comprising a main body which is rotatably fast with the lens body, a bulb-holding sleeve which is open at both ends and is integrally united with the main body as a single plastics molding, a first contact mounted opposite to one end of said sleeve in position to be engaged by the base of a bulb inserted in the other end of said sleeve, and a second contact extending within the side of said sleeve, said main body having a base provided with two bottom terminals one of which is central, the other of which is offset and each of which is connected to a different one of said contacts, said terminals being arranged to cooperate with central and offset terminals of a battery in said housing, to permit the lamp to be switched on and off by rotation of the lens body relative to the battery housing.

4,428,035
ELECTRONIC FLASHLIGHT FOR OPHTHALMOLOGICAL EXAMINATION INSTRUMENTS

Ortwin Müller, Aalen, and Albrecht Vogel, Oberkochen, both of Fed. Rep. of Germany, assignors to Carl-Zeiss-Stiftung, Heidenheim, Fed. Rep. of Germany

Filed Nov. 26, 1982, Ser. No. 444,763

Claims priority, application Fed. Rep. of Germany, Dec. 5, 1981, 8135489[U]

Int. Cl.³ F21S *3/00*

U.S. Cl. 362—224 **5 Claims**

1. An electronic flashlight for attachment to and use with an ophthalmological examination instrument of the type having a main lens and an optical axis passing axially through said main lens, said flashlight comprising

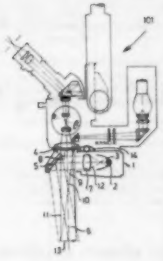
(a) a housing (1) adapted to be attached to said instrument under said main lens,

(b) said housing having openings (8, 9) for passage therethrough of an illumination beam (10, 15),

(c) an aspherical mirror (3) mounted in said housing on one side of said optical axis,

(d) an electronic flash tube (2) mounted at a focal point of said aspherical mirror and arranged, when fired, to project a beam of light from said aspherical mirror in a direction across said optical axis to the opposite side of said axis,

(e) a reflector mirror (5) mounted in the path of said beam on



said opposite side of said axis and positioned to reflect said beam in a direction away from said main lens and approximately along said optical axis and converging toward said optical axis to intersect with the optical axis approximately at the location (13) of a specimen being examined, and

(f) a condenser lens (7) mounted in said housing between said aspherical mirror (3) and said reflector mirror (5), said condenser lens being dimensioned to adapt the size of the field of illumination by the flashlight of the specimen being examined, to the magnification of the examination instrument.

4,428,036
LIGHT FITTINGS

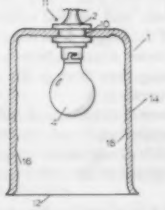
Philip W. Letcher, 6 Second Ave., Auckland, New Zealand

Filed Nov. 22, 1982, Ser. No. 443,522

Claims priority, application New Zealand, Apr. 14, 1982, 200299

Int. Cl.³ F21M *1/00*

U.S. Cl. 362—257 **2 Claims**

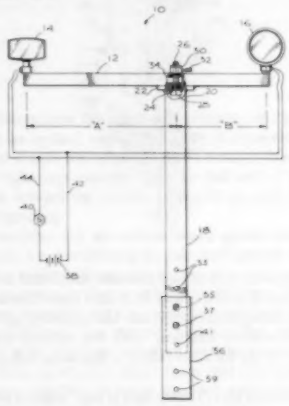


1. A light fitting comprising at least one source of light and a shade or surround formed of earthenware ceramic material at least partially surrounding and enclosing said at least one source of light, said material on at least the inside of said shade or surround being tinted with one or more colors and having a substantially rough cast surface.

4,428,037
VERSATILE LIGHTING BAR WITH DISSIMILAR ROTATABLE LIGHTS

Albert C. Cardoza, 1083 N. Terrace Dr., Colton, Calif. 92324; Von M. Dawley, 140 E. 18th St., San Bernardino, Calif. 92404; Edgardo C. Diaz, 1066 Buston Dr., Rialto, Calif. 92376; Michael E. Edson, 35240 San Pablo Dr.; Jerry J. Nelson, 12343 Custer St., both of Yucaipa, Calif. 92399; Robert D. Peters, 17821 Ivy Ave., Fontana, Calif. 92335; Dennis R. Wear, 231 W. 17th St., San Bernardino, Calif. 92405, and Daniel H. Wier, 35925 Andes Way, Yucaipa, Calif. 92399

Filed Oct. 13, 1982, Ser. No. 433,978
Int. Cl.³ F21V *21/26*
U.S. Cl. 362—250 **2 Claims**

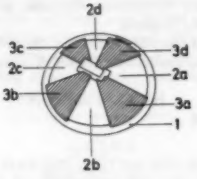


1. A lighting bar including:
an arm intended in use to be horizontal;
first and second electric lamps supported from said arm proximate the opposite extremities thereof;
said first electric lamp having, in operation, a beam of rectangular cross-section;
said second electric lamp having, in operation, a beam of circular cross-section;
a pole intended, in use, to be vertical;
coupling means, said coupling means including a plate secured, in a horizontal position, to the upper end of said pole and having an opening therein, centrally thereof;
a vertically disposed threaded shaft fixedly connected to said plate, passing thru said opening in said plate and extending above said pole, said arm having a vertical opening therethru to receive said shaft freely, for rotation of said arm about said shaft, said vertical opening in said arm being positioned off the longitudinal center of said arm whereby there is a greater distance from said first lamp to said vertical opening than there is from said second lamp to said vertical opening;
a nut having internal threads sized and pitched to cooperate with said threaded shaft and positioned on said shaft on the opposite side of said arm from said plate, whereby said nut can be adjusted to cause said arm to forcefully engage said plate;
said nut having a horizontally-disposed setting-pin therein;
said first electric lamp being supported for rotation only in the horizontal plane but through 360° and said second electric lamp being supported for rotation through only 180° in the horizontal plane but is also rotatable in the vertical plane.
and means for providing electrical energy to said first and second electric lamps.

4,428,038
DISTRIBUTED LIGHT REFLECTOR

Peter Rakitsch, Ismaning, and Albert Bodmer, Munich, both of Fed. Rep. of Germany, assignors to Patent-Treuhand-Gesellschaft für Elektrische Glühlampen mbH, Munich, Fed. Rep. of Germany

Filed Jun. 19, 1981, Ser. No. 275,150
Claims priority, application Fed. Rep. of Germany, Jul. 22, 1980, 3027774
Int. Cl.³ F21V *7/00*
U.S. Cl. 362—263 **21 Claims**



1. A reflector for illuminating an area from a source of emission of radiation comprising
at least four sector-shaped sections having contours whose generatrices follow elliptical curves having a common optical axis in the direction of radiation emission,
adjacent sectors having a different contour with respect to said source,
wherein the focal points of the elliptical curves coincide and the contour of the one elliptical section being such that a spot-type illumination results, and the contour of the other elliptical section being such that a saddle-type illumination is obtained; and wherein said contours follow the equations:

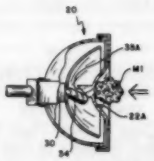
$$0.442359X^2-0.276790XY+Y^2+31.353331X-17.448185Y+294.045=0$$

$$0.580390X^2+2.997111XY+Y^{22}-49.9382\&X+214.9997Y-5171.662=0.$$

4,428,039
SAFETY LAMP APPARATUS INCLUDING MEANS FOR PREVENTING ACCIDENTAL BREAKAGE OF A BULB MEMBER

Roy A. Guimond, Holden; Charles F. Daly, Boylston, and John E. Gulliksen, Shrewsbury, all of Mass., assignors to Koehler Manufacturing Company, Marlborough, Mass.

Filed Mar. 23, 1982, Ser. No. 360,833
Int. Cl.³ F21V *15/04*
U.S. Cl. 362—287 **9 Claims**



1. A safety luminaire apparatus including a housing closed at one side by a substantially rigid plastic light transmitting member having a central axis, a bulb member yieldably received in the housing and operable when energized to provide a filament in a state of incandescence for emitting radiation, a portion of the inner surface of the said light transmitting member coinciding with and substantially surrounding the said central axis and

being located in close proximity to an outer end of the bulb member in a position to be driven into contact with the bulb in response to deformation resulting from impact forces exerted thereagainst, and said apparatus characterized by an obliquely disposed arrangement of parts in which means are provided for angular displacement of the bulb member when deformation of the said light transmitting member takes place inwardly along its central axis.

4,428,040

LOW POWER CONSUMPTION ELECTRONIC CIRCUIT

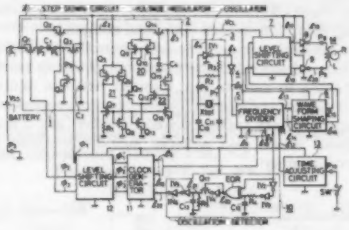
Osamu Yamashiro, Tokorozawa, and Toyohiko Hongo, Kodaira, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Aug. 13, 1981, Ser. No. 292,584

Claims priority, application Japan, Oct. 1, 1980, 55-135872

Int. Cl.³ H02M *3/06*

U.S. Cl. 363—62 **31 Claims**



1. An electronic circuit comprising:

a first node adapted to be supplied with a power supply voltage;

a second node;

a step down circuit including a plurality of capacitors and a plurality of switching elements for connecting said capacitors in series during a first time period and in parallel during a second time period, said step down circuit being made receptive of the power supply voltage supplied to said first node thereby to feed out a step down voltage to said second node, said step down circuit including; a first switching element connected between said first node and a third node and adapted to be periodically turned on; a first capacitor connected between said third node and a fourth node; a second switching element connected between said fourth node and the reference potential point of said circuit and adapted to be turned on when said first switching element is not turned on; a third switching element connected between said fourth node and said second node and adapted to be turned on substantially simultaneously with said first switching element; a fourth switching element connected between said third node and said second node and adapted to be turned on substantially simultaneously with said first switching element; a fourth switching element connected between said third node and second node and adapted to be turned on substantially simultaneously with said second switching element; and a second capacitor adapted to be charged by the voltage which is supplied to said second node;

a voltage detector for detecting that said power supply voltage has dropped to a predetermined value; and

a control circuit made receptive of a detection signal, which is fed out from said voltage detector, for supplying the voltage, which is supplied to said first node, to said second node, said control circuit simultaneously turning on at least said first and fourth switching elements on the basis of the output signal of said voltage detector.

4,428,041

DEVICE FOR PREVENTING IRREGULAR SUPPLYING OF PRINTING SHEETS FOR PRINTING MACHINE

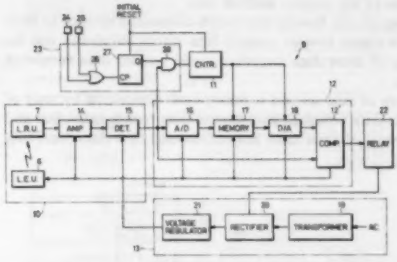
Yoshinori Honkawa, Fuchu, Japan, assignor to Ryobi Ltd., Hiroshima, Japan

Filed May 5, 1981, Ser. No. 260,615

Claims priority, application Japan, May 9, 1980, 55-62015

Int. Cl.³ G06F *15/46*

U.S. Cl. 364—183 **5 Claims**



1. A device for preventing irregular supplying of printing sheets for a printing machine comprising:

a detection circuit for detecting a quantity of light passing through printing sheets supplied to said printing machine;

a means for storing a value in a memory circuit representing a lowest quantity of light corresponding to a printing sheet detected by said detection circuit;

a counting means having a preset count manually set therein, said counting means having a clock input coupled to said output of said detector circuit for counting printing sheets, an output of said counter being coupled to an input of said memory circuit for causing said memory circuit to store the minimum of said values of said counted printing sheets; and

a control circuit connected to said memory circuit for automatically controlling said printing machine, said control circuit comprising a digital-to-analog converter having a digital input coupled to an output of said memory circuit and a comparison circuit having a first input coupled to an analog output of said digital-to-analog converter and a second input coupled to an output of said detecting circuit means, said digital-to-analog converter being enabled and said storing operation of said memory circuit being disabled by said control circuit when said count of said printing sheets equals said preset count manually set in said counting means, wherein when a quantity of light subsequently detected by said detection circuit is less than said value stored in said memory circuit, said control circuit causes said sheet supplying operation to be suspended.

4,428,042

INTERFACE DEVICE FOR COUPLING A SYSTEM OF TIME-DIVISION MULTIPLEXED CHANNELS TO A DATA CONCENTRATOR

Dieter Niethhammer, Putzbrunn; Robert Eggertsberger, Giessen, and Gerhard Wilmers, Munich, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Feb. 4, 1981, Ser. No. 231,455

Claims priority, application Fed. Rep. of Germany, Feb. 19, 1980, 3006165

Int. Cl.³ G06F *3/00, 15/16*

U.S. Cl. 364—200 **4 Claims**

1. A coupling device for coupling a time-division multiplex system to a concentrator of a data processing system, comprising:

a first data transmission bus, a first address bus, a first data

receiving bus and a first clock line in the area of the time-division multiplex system;

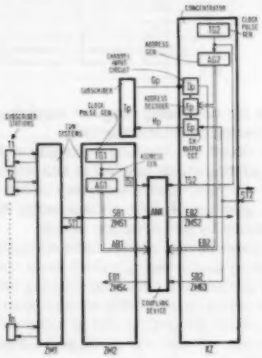
a second data transmission bus, a second address bus, a second data receiving bus and a second clock line in the area of the concentrator;

a plurality of first memory cells in the coupling device wherein a first memory cell is provided for each address of the first address bus;

a plurality of second memory cells in the coupling device wherein a second memory cell is provided for each address of the second address bus;

a group of said first memory cells connected by way of their data inputs to said second data transmission bus and by way of their data outputs to said second data receiving bus;

a group of said second memory cells connected by way of their data inputs to said second data transmission bus and by way of their data outputs to said first data receiving bus;



a plurality of first address decoders and a plurality of second address decoders, said first group of memory cells and said second group of memory cells respectively connected to said first and second address decoders;

said first and second address decoders connected to said first and second address buses, respectively;

a first clock control and a second clock control respectively connected to said first and second clock lines, said first and second clock controls generating sequences of first and second write instructions, respectively, with which data appearing on said first and second data transmission buses, respectively, are transferred as addresses into said memory cells of said first and second groups of memory cells, respectively, and said first and second clock controls further operable to generate sequences of first and second read instructions for reading data from said memory cells of said first and second groups, respectively.

4,428,043

DATA COMMUNICATIONS NETWORK

Robert D. Catiller, Garden Grove; Craig W. Harris, El Toro, and Ronald D. Mathews, Mission Viejo, all of Calif., assignors to Burroughs Corporation, Detroit, Mich.

Filed Aug. 24, 1981, Ser. No. 295,587

Int. Cl.³ G06F 3/04

U.S. Cl. 364—200 **3 Claims**

1. A data communications network comprising:

(a) a main host computer having a main processor and main memory, said host computer communicating via a first bus (MLI) means to a base connection module;

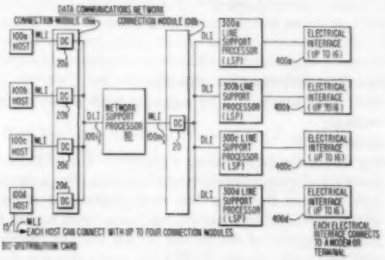
(a1) said first bus means for carrying data and control signals between said main host computer and a network support processor-controller via a first Distribution control circuit unit;

(b) said base connection module for housing and interconnecting a plurality of circuit units, said plurality of circuit units forming an I/O subsystem which includes:

(b1) said first Distribution control circuit unit which includes means responsive to requests from said main host computer and/or said network support processor-controller, for connecting said network support processor-controller to said main host computer for data transfer operations therebetween, and for disconnecting said main host computer from said network support processor-controller when said processor-controller is occupied in transferring data to/from a line communications processor;

(b2) a second Distribution control circuit unit which includes means, responsive to requests from said network support processor-controller and/or said line communications processor, for connecting said processor-controller to said line communications processor for data transfer operations therebetween, and for disconnecting said processor-controller from said line communications processor when said processor-controller is occupied in transferring data to/from said main host computer;

(b3) said network support processor-controller connected to said first and second Distribution control circuit units and functioning to execute data transfers between said main host computer and said line communications processor via a shared memory means, shared by a first and a second processor means said network support processor-controller including:



(b3-a) an Interface circuit unit connecting a master processor means and a master memory controller to said first and second Distribution control circuit units, said Interface circuit operating under control of said master processor means, and which includes:

(b3-a1) means for synchronous data transfer to/from said first Distribution control circuit unit;

(b3-a2) means for asynchronous data transfer to/from said second Distribution control circuit unit;

(b3-b) master processor-controller means including:

(b3-b1) said first processor means for generating instructions and control signals for operation of said Interface circuit unit and for operation of a slave processor-controller means;

(b3-b2) a first memory control circuit, connected to said first processor means and including:

(b3-b2a) first memory means for storing instructions and data for said first processor means;

(b3-b2b) first memory logic means for generating addresses to access a shared memory means;

(b3-c) a slave processor-controller means including:

(b3-c1) said second processor means for accessing data in said shared memory means and including:

(i) means to edit and manipulate protocol format of data from said shared memory means;

(ii) means to return processed data back to said shared memory means;

(iii) means to transfer said processed data, under instructions from said first processor means, to said first or second Distribution control circuit means via said Interface circuit unit;

(b3-c2) a second memory control circuit, connected to said second processor means, and including:

(i) second memory means for storing instructions and data for said second processor means;

(ii) second memory logic means for generating memory addresses to access said shared memory means;

(c) said shared memory means, connected to said first and second memory control circuit and to said Interface circuit for temporary storage of data-in-transit between said host computer and said line communications processor;

(d) said line communications processor connected to said Interface circuit unit via said second Distribution control circuit unit, said line communications processor including:

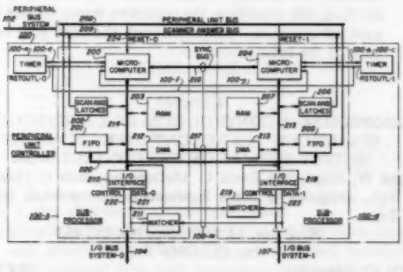
(i) a plurality of Line Adapters, wherein each Line Adapter services a data communication line to a remote peripheral terminal;

(ii) means to control data transfers between said remote peripheral terminal and said second Distribution control circuit unit.

4,428,044
PERIPHERAL UNIT CONTROLLER

Moshe Liron, Evanston, Ill., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Sep. 20, 1979, Ser. No. 77,512
Int. Cl.³ G06F *15/16*
U.S. Cl. 364—200 **13 Claims**



1. In a data processing system including a peripheral unit controller comprising duplicated first and second subprocessors for improved reliability and a first timer circuit external to said subprocessors for controlling the synchronous starting of said subprocessors, said system comprising:

a processor adapted to generate and transmit a plurality of peripheral orders to said first and second subprocessors; and transmission means interconnecting said processor and said subprocessors;

said first timer circuit being responsive to a first timer start signal to generate a first timer completion signal a predetermined period of time after the occurence of said first timer start signal;

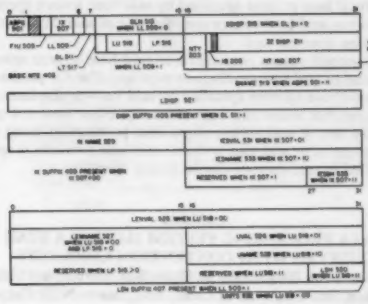
said first subprocessor having a halt state and being responsive to a first one of said peripheral orders received from said transmission means to generate said first timer start signal and to enter its halt state;

said second subprocessor having a halt state and being responsive to a second one of said peripheral orders received on said transmission means to enter its halt state and said first and said second subprocessors being responsive to said timer completion signal while in their halt state to start synchronized operation.

4,428,045
APPARATUS FOR SPECIFYING AND RESOLVING ADDRESSES OF OPERANDS IN A DIGITAL DATA PROCESSING SYSTEM

Gary Davidian, Mountain View, Calif., assignor to Data General Corporation, Westboro, Mass.

Filed Sep. 11, 1981, Ser. No. 301,998
Int. Cl.³ G06F *1/00, 9/00*
U.S. Cl. 364—200 **3 Claims**



1. In an improved digital data processing system including

(1) memory means for storing items of data including

(a) procedures containing instructions and

(b) pointers representing addresses in said memory means and providing said items in response to memory signals specifying addresses of said items in said memory means,

(2) processor means for providing said memory signals to said memory means, receiving said data and said instructions from said memory means, and processing said data in response to said instructions, and

(3) communications means for transferring said items and said memory signals between said processor means and said memory means,

and wherein

said processor means performs a procedure execution for a process by executing said instructions in said procedure using a plurality of process items of said items specified for said process,

said process items include a set of architectural base pointers of said pointers associated with each said procedure execution performed by said process,

said instructions contain table names representing said items, each said table name specifying one name table entry of said items in a name table of said items associated with said procedure containing said instructions,

each said name table entry includes at least a basic name table entry and said name table entry including said basic name table entry specifies said address of said item represented by said table name specifying said name table entry by specifying a base address of said addresses and a displacement,

and wherein further

said processor means includes name processing means responsive to said table names and said name table entries for producing said address of said represented item from said name table entry associated with said table name representing said represented item by processing said associated name table entry,

the improvements comprising:

(1) an improved said basic name table entry including

(a) a base source specifier alternatively specifying

(i) one of said architectural base pointers or

(ii) that said base address is not said address represented by one of said architectural base pointers, and

(b) a base-or-displacement specifier alternatively specifying

(i) said displacement when said base source specifier specifies one of said architectural base pointers and

(ii) otherwise said base address; and

(2) an improved said name processing means including

(a) first means responsive to said base source specifier and to said base-or-displacement specifier for adding said displacement specified by said base-or-displacement specifier to said address represented by said architectural base pointer specified by said base source specifier when said base source specifies one of said architectural base pointers and

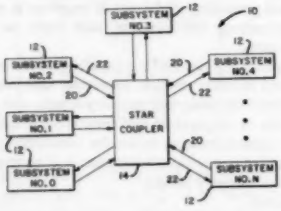
(b) second means responsive to said base source specifer and to said base-or-displacement specifier for producing said base address specified by said base-or-displacement specifier when said base source specifier does not specify one of said architectural base pointers by using said name table and said architectural base pointers as specified in said base-or-displacement specifier.

4,428,046

DATA PROCESSING SYSTEM HAVING A STAR COUPLER WITH CONTENTION CIRCUITRY

Venu Chari, San Diego; Jack R. Duke, San Marcos, and Shimon Gersten, San Diego, all of Calif., assignors to NCR Corporation, Dayton, Ohio

Filed May 5, 1980, Ser. No. 146,805
Int. Cl.³ G06F 15/16
U.S. Cl. 364—200 **4 Claims**



1. A data processing system, comprising:

a plurality of subsystems, wherein each subsystem has an active condition when generating a message and an idle condition when no message is being generated, and wherein each subsystem generates a stream of repetitive binary bits when in its idle condition;

first transmission means associated with each subsystem for carrying messages from the associated subsystem when the associated subsystem is in its active condition, and for carrying said stream of repetitive binary signals from the associated subsystem when the associated subsystem is in its idle condition;

second transmission means associated with each subsystem for carrying messages to the associated subsystem, and for carrying said repetitive binary signals to the associated subsystem;

a star coupler for linking each first transmission means to every second transmission means so that a message from the first transmission means associated with one of said subsystems can be passed to the second transmission means associated with every subsystem, including contention circuitry in the star coupler for selecting one subsystem and controlling the star coupler so that only the messages from the first transmission means of the selected subsystem are passed through the star coupler to each second transmission means associated with every subsystem, and wherein said contention circuitry comprises means for controlling the star coupler to pass only the meassage received first in time at the star coupler, and for assigning a relative priority to each of said subsystems, for controlling the star coupler so that, if the beginning of more than one message is received simultaneouly from more than one subsystem, only the message from the first transmission means associated with the subsystem having a higher assigned priority is passed to each second transmission means wherein said contention circuitry includes means for detecting the absence of a message on any first transmission means;

first gate means associated with each subsystem, each first gate means being connected to the first transmission means of its associated subsystem for receiving any message generated from its associated subsystem, and each first gate means being controlled by the contention circuitry to pass a message only when its associated subsystem has been selected by the contention circuitry;

second gate means associated with each subsystem, each second gate means being connected to every first gate means for receiving messages passed by each first gate means, each second gate means being connected to the second transmission means of its associated subsystem to pass a message thereto, each second gate means being controlled by the contention circuitry so that when one of the subsystems has been selected to have its message passed through the star coupler, each second gate means receives the message from the first gate means associated with the selected subsystem and passes the message to the second transmission means of its associated subsystem; and

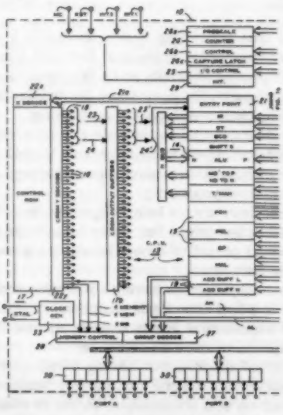
third gate means associated with each subsystem, each third gate means connected between the first transmission means and the second transmission means of its associated subsystem and controlled by the means for detecting the absence of a message so that when all of the subsystems are in an idle condition, the repetitive binary signals from each subsystem are passed through the third gate means back to the same subsystem.

4,429,047

ADDRESSING A CONTROL ROM IN A MICROCODED SINGLE-CHIP MICROCOMPUTER USING THE OUTPUT SIGNALS OF THE CONTROL ROM

John W. Hayn, and Kevin C. McDonough, both of Houston, Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Apr. 13, 1981, Ser. No. 253,452
Int. Cl.³ G06F 9/22
U.S. Cl. 364—200 **20 Claims**



1. A microprocessor device comprising:

a semiconductor integrated circuit having an arithmetic/-

logic unit, a plurality of registers for storing data and memory addresses, an instruction register, parallel bus means for interconnecting the arithmetic/logic unit and the registers, and control means having an input coupled to the instruction register and generating control signal outputs coupled to the arithmetic/logic unit, to the bus means and to the registers to control operation thereof in response to instruction words, all within the integrated circuit,

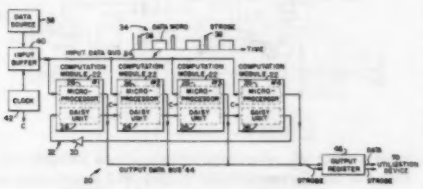
wherein the control means includes a read-only-array having an address input coupled to said input of the control means and having outputs coupled to said control signal outputs, said control means having addressing means for applying sequences of addresses to said address input to define an operation selected by an instruction word in the instruction register, each sequence including a group dispatch to select an addressing mode using one or more of said addresses and subsequently including a function dispatch to select an arithmetic/logic function using one or more of said addresses, the group and function dispatches being controlled by fields of bits of said instruction word in said instruction register.

4,428,048

MULTIPROCESSOR WITH STAGGERED PROCESSING

Edwin P. Berlin, Jr., Greenlawn, N.Y., assignor to Grumman Aerospace Corporation, Bethpage, N.Y.

Filed Jan. 28, 1981, Ser. No. 229,269
Int. Cl.³ G06F *15/16*
U.S. Cl. 364—200 **12 Claims**



1. A data processing system comprising:

a plurality of processors connected to a data source, each of said processors performing a predetermined function on data received from said data source independently of the other of said processors;

a plurality of daisy units interconnected serially in a series arrangement for initiating the operation of said processors on a time-staggered basis by sequentially strobing said processors, each of said daisy units being connected to a mating one of said processors; and

an inverter connected between the first and last daisy units of said series arrangement for inverting an input signal generated by said last daisy unit and passed to said first daisy unit so as to continuously propagate said strobing;

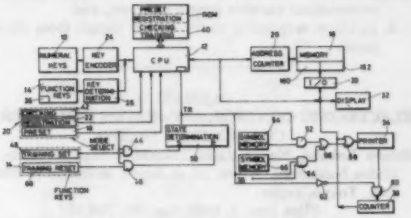
each of said daisy units including an exclusive -OR logic circuit having a first input connected to an output terminal of an immediately preceding daisy unit in said series arrangement for receiving a present input signal generated by said immediately preceding daisy unit, and a second input connected to an output of a delay circuit for receiving an immediately previous input signal generated by said immediately preceding daisy unit, said delay circuit having an input connected to said output terminal, said exclusive -OR logic circuit sensing a difference between the logic levels of said present and previous input signals so that said daisy unit subsequently strobes its mating processor so that said processor performs its predetermined function on its received data.

4,428,049

TRAINING MODE OPERATION IN AN ELECTRONIC CASH REGISTER

Ryuji Miyazaki, Kashiwara, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Jun. 11, 1981, Ser. No. 272,579
Claims priority, application Japan, Jun. 20, 1980, 55-84419; Jun. 20, 1980, 55-84420; Jun. 20, 1980, 55-84421
Int. Cl.³ G06F *15/20*
U.S. Cl. 364—405 **6 Claims**



1. An electronic cash register comprising:

keyboard means for introducing data into said register;

processor means responsive to the information introduced by said keyboard means for controlling the operation of said cash register;

program memory means for controlling operations in said processor means including operations during a training mode;

data memory means for receiving transaction data from said processor means, said data memory means including,

accumulation memory section means for accumulating transaction data during a normal registration operation mode, and

training mode memory section means for storing transaction data during the training mode; and

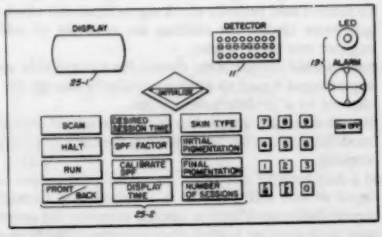
mode selection means for selecting between the normal registration operation mode and the training operation mode.

4,428,050

TANNING AID

Frank Pellegrino, 3162 Parsifal Pl., Bronx, N.Y. 10465, and Alexander Kalpaxis, 61-17 68 St., Ridgewood, Queens, N.Y. 11385

Filed Apr. 2, 1981, Ser. No. 250,181
Int. Cl.³ G06F *15/42*
U.S. Cl. 364—414 **7 Claims**



1. A portable tanning aid for monitoring the tanning of a person in a controlled manner over a series of spaced apart tanning session comprising:

a. radiation detection means for detecting radiation received in the UV region of the light spectrum,

b. integrating means for integrating the output of the radia-

tion detector means and generating therefrom a pulse train having a pulse repetition frequency proportional to the instantaneous intensity of the radiation detection means,

c. a programmable computer for processing the pulse signals from the integrator means, said programmable computer including a counter for counting pulses, a continuous memory for storing the number of pulses received from one tanning session to the next tanning session and a continuous clock for measuring time between sessions and generating output signals when the number of pulse signals reaches a preselected amount and also at preselected intermediate variable length intervals, and

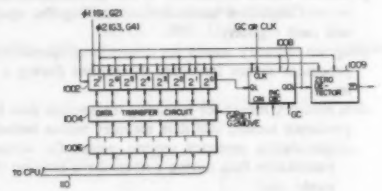
d. an alarm responsive to the output signals from the computer.

4,428,051

ELECTRONIC CONTROL APPARATUS FOR INTERNAL COMBUSTION ENGINE

Shigeo Kuboki, Nakaminato; Takeshi Hirayama, Mito, and Hideo Nakamura, Tokyo, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Nov. 5, 1980, Ser. No. 204,347
Claims priority, application Japan, Nov. 9, 1979, 54-144463
Int. Cl.³ G06F 7/385, 7/50; F02D 5/02
U.S. Cl. 364—431.12 **16 Claims**



1. For use in a control apparatus for an internal combustion engine wherein at least one condition of the engine is detected and a reference value of a control mechanism for controlling the engine is calculated based on the detected engine condition and a control pulse signal is produced in accordance with the calculated reference value to apply said control pulse signal to said control mechanism in order to control the engine in accordance with said reference value, and including

means for producing the control pulse signal in accordance with said reference value includes a clock signal generator circuit for generating a periodic clock signal having a predetermined period and a plurality of pulse signal generator circuits, each pulse signal generator circuit including:

a shift register to which said reference value is loaded in the form of a digital signal, said shift register being adaptable to receive said periodic clock signal from said clock signal generator circuit for shifting the contents of said shift register one bit at a time,

a controllable modification circuit for controllably modifying an input signal so as to controllably change the value thereof by a predetermined value,

a detection circuit, coupled to the output of said controllable modification circuit, for detecting the content of said shift register,

and a data transfer circuit for connecting the output and the input of said shift register in a closed loop through said controllable modification circuit, whereby the contents of said shift register loaded therein is controllably modified by applying the content of the shift register to said controllable modification circuit and then sending it back to the shift register and said detection circuit monitors the output of said controllable modification circuit and detects a point of detection when the content of the shift register reaches a predetermined value so that the control pulse signal is produced from or to the point of detection.

12. An output circuit for producing a pulse in accordance with data supplied thereto, comprising:

a shift register, coupled to receive said data;

a controllable signal modification circuit for controllably modifying an input signal by a predetermined value having an input coupled to an end stage of said shift register from which signals shifted therethrough are derived and an output coupled to an opposite end stage of said shift register; and

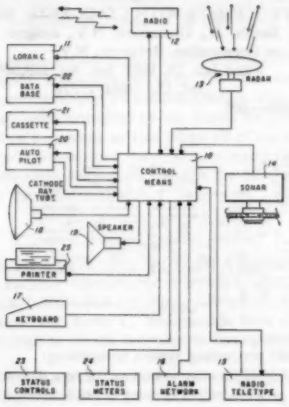
a fixed state detection circuit having in in put coupled to the output of said controllable signal modification circuit and producing an output pulse in response to the output of said controllable signal modification circuit maintaining a prescribed representative state for the entirety of the shifting of the contents of said shift register through the total number of stages therein.

4,428,052

NAVIGATIONAL AID AUTOPILOT

Eugene A. Robinson; Jerry L. Setliff, both of Dallas; Michael D. Smith, Plano, and John P. Volpi, Dallas, all of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Jun. 9, 1981, Ser. No. 271,914
Int. Cl.³ G06F 15/50
U.S. Cl. 364—436 **21 Claims**



1. A navigational aid system for providing correlated informational data in a form facilitating the operation of a craft, said navigational aid system comprising:

means for determining the status of at least one external physical condition independent of the operation of the craft but having significance with respect to the operation of the craft and producing first output data indicative thereof;

means for determining the status of at least one internal physical state of the craft independently of said external physical condition status-determining means and producing second output data indicative thereof;

means providing a surface characteristics representation of a selected portion encompassing an area of the surface of the earth related to the position in which the craft is disposed;

data processing means operably coupled to said external physical condition status-determining means, said internal physical state status-determining means, and said surface characteristics representation means for automatically correlating said first and second output data with said surface characteristics representation to produce combined correlated output data significant to the continued operation of the craft; and

data presentation means coupled to said data processing

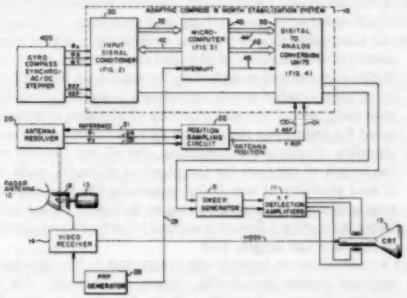
means and responsive to said combined correlated output data produced therefrom to provide a presentation of said combined correlated output data in a unitary format readily comprehendible by an operator.

4,428,053

ADAPTIVE COMPASS AND NORTH STABILIZATION DRIVE SYSTEM

John M. Tol, Sudbury, Mass., assignor to Raytheon Company, Lexington, Mass.

Filed Jun. 29, 1981, Ser. No. 278,795
Int. Cl.³ H03K *13/02*
U.S. Cl. 364—457 19 Claims



1. An adaptive compass drive system for use with a radar system including a PPI display adapted to respond to either DC or AC incremental positioning devices of the stepper-type output or synchro-type gyro compass output comprising means for providing preconditioning of the three-phase carrier output signals of either type of said incremental positioning devices into stepped waveforms the crossover points of equal carrier amplitude representing the angular change in the position of the gyro compass shaft of said incremental positioning devices;

means for determining the values of equal amplitude for any two phases of said DC stepper-type or said AC synchro-type conditioned signals in said preconditioning means;

said latter means including means for sensing the occurrence of single or multiple step increment or decrement output signals;

a microprocessor adapted to operate in response to the output signals of said preconditioning means and to derive from a comparison with previously stored values from said preconditioning means without the use of intermediary mechanical devices a coded change signal representing incremental change in angular position of said gyro compass shaft, said microprocessor further including real-time output signal means in a format of digital codes representing the sine and cosine of the intended PPI rotation angle; and

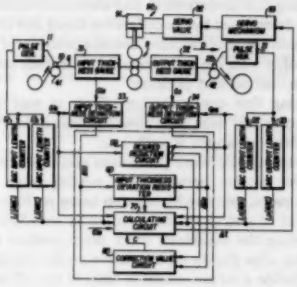
means including a D to A unit to combine digital codes representing said coded change signal from said microprocessor with X and Y position voltages from said radar system to generate X and Y sweep reference voltages for orientation of the PPI display of said radar system.

4,428,054

AUTOMATIC CONTROL METHODS AND DEVICES FOR ROLLING MILLS

Hitoshi Aizawa, Kobe, and Masaaki Takarada, Akashi, both of Japan, assignors to Kawasaki Steel Corporation, Hyogo, Japan

Filed Apr. 29, 1981, Ser. No. 258,779
Claims priority, application Japan, Nov. 5, 1979, 54-143142; Dec. 17, 1979, 54-163855; Dec. 17, 1979, 54-163856
Int. Cl.³ B21B *37/12*; G05D *5/03*; G06F *15/46*
U.S. Cl. 364—472 16 Claims



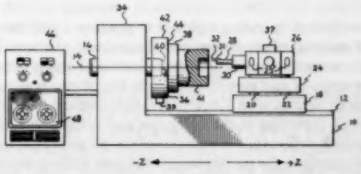
1. The method of automatically controlling the rate of reduction in a rolling mill comprising the steps of: rolling a material at a predetermined rate of reduction, controlling the rate of reduction in such a manner that an output thickness of the material being rolled is calculated from an actually measured input thickness of the material and a desired rate of reduction, estimating an input thickness from the output thickness thus calculated, an input length and an output length based on the principle of constant mass-flow rate of the material being rolled, such that the difference between the estimated input thickness and an actually measured input thickness can be diminished to zero.

4,428,055

TOOL TOUCH PROBE SYSTEM AND METHOD OF PRECISION MACHINING

John R. Zurbrick and John R. Kelley, both of Cincinnati, Ohio, assignors to General Electric Company, Salem, Va.

Filed Aug. 18, 1981, Ser. No. 293,799
Int. Cl.³ G06F *15/46*
U.S. Cl. 364—474 36 Claims
MICROFICHE APPENDIX INCLUDED
(2 Microfiche, 87 Pages)



1. A method for precision machining at least one surface of a work piece by means of a programmable, numerically controlled machining system, said system including numerical control means adapted to operate under the direction of a selected machining program, at least one cutting tool and at least first and second reference surfaces adapted to provide a position reference with respect to the origin position of the selected program;

said method comprising:

(1) probing said reference surfaces with a cutting edge of said tool during rapid relative motion therebetween to calibrate the position of said cutting edge in at least first and second axes of motion each normal to one of said reference surfaces;

(2) sensing vibrations transmitted upon the occurrence of probing contact between said cutting edge and the probed reference surface;

(3) signaling the actual contact position of said cutting edge to said numerical control means in each of said axes in response to said sensed vibrations;

(4) storing first deviations in said numerical control means each determined by the difference along one of said axes between the programmed contact position of said cutting edge with the corresponding reference surface and said actual contact position;

(5) storing first compensating offsets in said numerical control means each determined at least in part by one of said first deviations in each axis;

(6) machining said work piece with said tool during rapid relative motion between said cutting edge and said work piece, said machining step being performed under control of said program modified by said first offsets;

(7) probing the machined work piece surface with said cutting edge during rapid relative motion therebetween to provide a measurement at least in one of said axes;

(8) sensing vibrations transmitted upon the occurrence of probing contact between said cutting edge and said machined surface; and

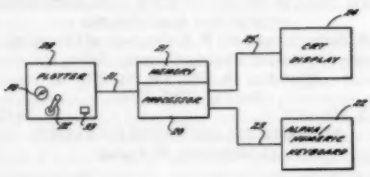
(9) signaling the actual contact position of said cutting edge in at least said one axis to said numerical control means in response to said last-recited sensed vibrations.

4,428,056

PLOTTING METHOD AND APPARATUS

Kenneth Schroeder, Wonder Lake, and James Griffin, Carpentersville, both of Ill., assignors to Pattern-Scan, Inc., Wonder Lake, Ill.

Filed Jun. 1, 1981, Ser. No. 266,071
Int. Cl.³ G06F *15/00*
U.S. Cl. 364—518 **4 Claims**



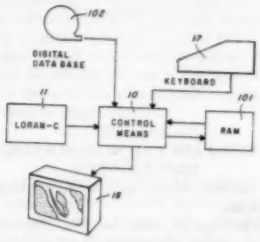
1. A method of operating a plotter to produce a plot showing the fit of material of predetermined dimensional characteristics into a given area including the identification of seams between adjacent strips of said material, wherein the plotter is arranged to exchange signals with a computer, said method comprising the steps of, inputting to the computer and storing an array of signals which define the coordinates of the given area, transferring said signals to the plotter to plot the area outline, inputting to the computer and storing a set of signals related to the dimensional characteristics of the material, manually manipulating the plotter to produce and transfer a signal to the computer defining a selected seam separating two adjacent strips of material, transferring signals from the computer to the plotter to plot all seams between each strip of material, defining the length of each plotted strip, and determining and displaying the order in which the strips are to be taken from a material supply.

4,428,057

ELECTRONIC CHART SYSTEM

Jerry Setliff, Dallas; Gerald Burnham; Michael Smith, both of Plano, all of Tex., and Richard D. Hoffman, Kenvil, N.J., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Jun. 9, 1981, Ser. No. 271,917
Int. Cl.³ G06F *15/50*
U.S. Cl. 364—521 **8 Claims**



1. A chart display system comprising:

(a) a display means for receiving run information for a preselected number of row and column scan lines for display;

(b) an attachable memory means containing a digital representation of a plurality of physical elements of a chart, said digital representation including for each scan line a plurality of binary coded words including a word for selectively indicating one of the said plurality of physical elements, a word for indicating the number of runs in said scan line, a plurality of words for indicating, for all but the last run, the length of the runs for the physical elements, each one of said plurality of words for indicating the length of the runs is of variable length having an indicator bit for selectively indicating a first or a second predetermined number of bits as a run length, and

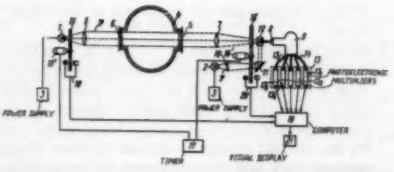
(c) a control means operatively connected to the attachable memory means and display means, respectively, for receiving the run information thereof and converting the run information to electrical representations for display.

4,428,058

METHOD OF DETERMINING TEMPERATURE OF GAS AND PARTICLES IN MAGNETOHYDRODYNAMIC GENERATOR

Inna A. Vasilieva, and Alexandr S. Urinson, both of Moscow, U.S.S.R., assignors to Institut Vysokikh Temperatur Akademii Nauk SSR, Moscow, U.S.S.R.

Filed May 14, 1981, Ser. No. 263,408
Claims priority, application U.S.S.R., May 14, 1980, 2915901
Int. Cl.³ G01J *5/00*; G01K *13/00*
U.S. Cl. 364—557 **2 Claims**



1. A method of determining temperature of gas and solid or liquid particles in a conductive working medium contained in a chamber of a magnetohydrodynamic generator comprising the steps of:

measuring intensity value $\phi 1$ of a primary source of radiation passing through walls of said container and having at least two wavelengths having values λ_1 and λ_2, respectively;

measuring intensity value $\phi 2$ of radiation of said working medium at least of said two wavelengths having values λ_1 and λ_2, respectively;

measuring intensity value $\phi 3$ of radiation of said working medium subject to radiation from said primary source of radiation at least of said two wavelengths λ_1 and λ_2;

selecting said wavelength λ_1 at the center of a resonant line of an alkaline metal spectrum;

selecting said wavelength λ_2 from the relationship

$$\frac{\lambda_1 - \lambda_2}{\Delta\lambda_\nu} > \left(\frac{5.5 \cdot 10^{19}}{\tau(\lambda_2)} \cdot \frac{P}{T_{min}} \cdot y \cdot \rho \cdot x_\nu\right)^{\frac{1}{x}}$$

repeated measurements of said intensity values $\phi 1$, $\phi 2$, and $\phi 3$ of said radiation fluxes on said wavelengths λ_1 and λ_2 to obtain a group of said values;

selecting those groups from said groups of the intensity values $\phi 1$, $\phi 2$ and $\phi 3$ of radiation fluxes, wherein said values $\phi 1$, $\phi 2$ and $\phi 3$ at a permissible error k satisfy the relationship

$$\frac{\left(\frac{\phi_1 - \phi_3}{\phi_2}\right)^2 \phi_2 + \phi_1 + \phi_3}{(\phi_1 + \phi_2 - \phi_3)} < \left(\frac{C_2}{\lambda \cdot T_{max}}\right)^2 \cdot \frac{10^{-4} \cdot K^2}{K_1}$$

calculating mathematically the temperature of gas and particles of said working medium of said MHD generator from relationships obtained by a generalized method of reversing spectral lines, where P is the pressure of combustion products;

T_{min}'T_{max}=approximate values of possible minimum and maximum temperatures of said working medium of the MHD generator, respectively;

y=mole content of atoms of said alkaline metal with a resonant spectral line one of the alkaline metals on said wave length λ_1

l=thickness of said working medium;

χ_ν=Voigt atomic absorption coefficient at a distance $\Delta\lambda_\nu$ from the centre of the spectral line, where the Voigt coefficient is transformed into a power factor with an exponent (−X);

C_2=radiation constant equalling 14,380 microdegrees;

k_1=coefficient determining the shot effect in a photodector; λ is chosen from λ_1 and λ_2;

$\tau(\lambda_2)$=permissible optical density on said wavelength λ_2 satisfying the relationship

$$\tau(\lambda_2) \leq \ln \frac{\phi_1(\lambda_2)}{\phi_3(\lambda_2) - \phi_1(\lambda_2)} \cdot \frac{e^{\frac{C_2 \cdot K}{\lambda_2 \cdot T'}} - 1}{\frac{\phi_2(\lambda_1)}{\phi_2(\lambda_2)} - 1}$$

where T'=measured temperature of the particles.

4,428,059

REAL TIME FILL CIRCUIT

James M. Gessert, Evergreen, Colo., assignor to Honeywell Inc., Minneapolis, Minn.

Continuation of Ser. No. 173,874, Jul. 30, 1980, abandoned. This application Aug. 25, 1982, Ser. No. 411,398

Int. Cl.³ G06F *15/20, 15/42*

U.S. Cl. 364—577 **10 Claims**

1. Interpolating means for interpolating between successive units of significant digital data signals in a data stream separated by a number of data spaces, said interpolating means comprising:

first means for determining the magnitude of the difference between successive units of significant digital data and for producing a corresponding digital difference signal;

second means for determining the number of consecutive data spaces between successive units of significant digital data and for producing a corresponding digital space signal;

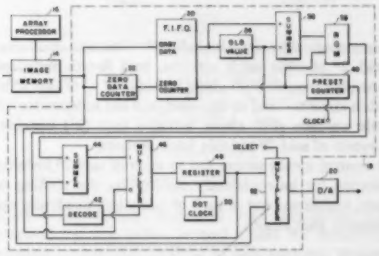
third means connected to said first means and said second means to be responsive to said difference signal and said space signal to produce a digital fraction value signal representing a corresponding fractional portion of said difference signal;

means for sequentially incrementing said successive significant digital data signals in said data stream with said digital fractional value signal in accordance with said digital data space signal whereby to provide incremented value signals corresponding in number to the respective digital data space signals; and

means for introducing said incremented value signals seriatim between adjacent ones of said significant digital data signals to provide an interpolated digital data signal stream.

8. Image data display apparatus comprising:

means for transmitting and, after a time period, receiving reflected pulsed analog image data signal;



means for converting said analog image data signals to significant digital image data signals;

memory means for storing said significant digital image data signals in a predetermined array in said memory means in which successive units of said significant digital image data signals are separated by a number of data spaces such number varying with the time period;

circuit means including digital interpolating means for providing a number of interpolative digital fractional value signals in said data spaces between said successive units of significant digital image data signals the number of said interpolative fractional value signals being a function of the number of said data spaces;

said circuit means further including means for converting the significant digital image data signals and said interpolative digital fractional value signals from said interpolating means to output analog signals; and

means for controlling the Z-axis modulation of an image display apparatus in accordance with said output analog signals.

4,428,060

SHIFT REGISTER LATCH CIRCUIT MEANS FOR CHECK AND TEST PURPOSES AND CONTAINED IN LSI CIRCUITRY CONFORMING TO LEVEL SENSITIVE SCAN DESIGN (LSSD) RULES AND TECHNIQUES

Arnold Blum, Gechingen, Fed. Rep. of Germany, assignor to International Business Machines Corporation, Armonk, N.Y.

Filed May 18, 1981, Ser. No. 264,896

Claims priority, application Fed. Rep. of Germany, Aug. 9, 1980, 3030299

Int. Cl.³ G06F *7/00*; G11C *19/00*

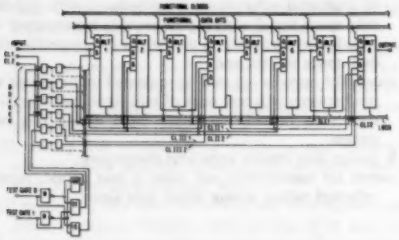
U.S. Cl. 364—715 **5 Claims**

1. In a functional logic unit for performing at least one logical function, said functional logic unit including:

2^n bistable latch circuits where n is a positive integer equal to

two or greater in magnitude and each said bistable latch circuit has an input and an output;

connection means for connecting said 2^n bistable latch circuits into n independently operable cascade shift chains, each of said n cascade shift chains having an input and an output and wherein said first independently operable cascade shift chain includes each of said 2^n bistable latch circuits, said second independently operable cascade shift chain includes 2^{n-1} of said 2^n bistable latch circuits, said third independently operable cascade shift chain includes 2^{n-2} bistable latch circuits of said 2^n bistable latch circuits, said fourth independently operable cascade shift chain includes 2^{n-3} of said 2^n bistable latch circuits—and so on—and said last independently operable cascade shift chain includes two (2^1) bistable latch circuits of said 2^n bistable latch circuits;



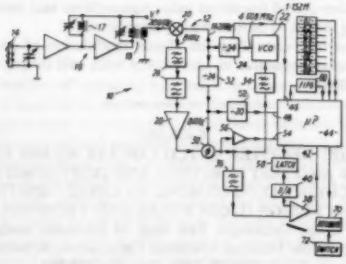
and control means connected to each of said 2^n bistable latch circuits for independently controlling the shifting of data into, within and out of each of said n independently operable cascade shift chains.

4,428,061

METHOD AND APPARATUS FOR RECEIVING CARRIER-BORNE DIGITAL SIGNALS INTENDED TO OPERATE REMOTELY-OPERABLE SWITCHING DEVICES

Michael J. Skinner, Fleet; Jack Woollven, Camberley; Eric Metcalf, Alresford, and Howard A. Dorey, Godalming, all of England, assignors to Sangamo Weston Limited, Enfield, England

Filed Feb. 17, 1981, Ser. No. 234,533
Claims priority, application United Kingdom, Feb. 18, 1980, 8005455
Int. Cl.³ G06F 15/34; H04L 27/18, 27/22
U.S. Cl. 364—728 29 Claims



1. A receiver for receiving a signal comprising a radio frequency carrier signal of frequency f_1 modulated with a digital signal of known, relatively low, bit rate, the receiver comprising:

an input circuit for receiving the modulated carrier signal;

demodulator means connected to receive and demodulate the signal received by the input circuit, so as to produce an output signal which contains said digital signal;

local oscillator means for producing a series of N reference signals whose frequency is half said known bit rate, each successive signal in the series having a different phase difference with respect to the first signal of the series; and

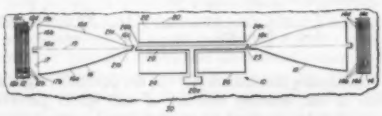
correlator means for correlating each reference signal with the output signal produced by the demodulator means including means for identifying which of said reference signals is most nearly in phase with the bits of the digital signal, and for determining the values of successive bits of the digital signal by correlating the reference signal thus identified with said output signal.

4,428,062

SURFACE ACOUSTIC WAVE CONVOLVER HAVING A HORN CENTRAL RAY TRANSIT TIME COMPENSATING STUB

Paul A. Michaels, Livonia, Mich., assignor to The Bendix Corporation, Southfield, Mich.

Filed Aug. 11, 1981, Ser. No. 291,753
Int. Cl.³ G06G 7/195; H01L 41/08; H03H 9/30
U.S. Cl. 364—821 7 Claims



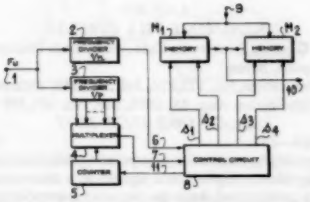
1. A surface acoustic wave convolver including at least one thin film parabolic horn disposed on a substrate and having a relatively wide input end for receiving a surface acoustic wave incident thereon and a relatively narrow output end toward which said wave propagates through said horn material, the central rays of said wave traversing said horn material directly to said output end and the rays of said wave outside said central rays traversing said horn material to said output end by reflection from the sides of said horn, an improvement comprised of a compensating stub disposed on said input end for intercepting said central rays to equalize the transit times of all parts of said wave from a line outside said horn and normal to the direction of travel of said wave to said output end.

4,428,063

DATA TIME COMPRESSION DEVICE AND DECOMPRESSION DEVICE

Pierre Fourcade, Paris, France, assignor to Thomson-CSF, Paris, France

Filed Sep. 29, 1981, Ser. No. 306,648
Claims priority, application France, Oct. 3, 1980, 80 21226
Int. Cl.³ G06F 5/06
U.S. Cl. 364—900 2 Claims



1. A device for the time compression of a continuous sequence of data, so as to effect a compression in a ratio k=p/n (p and n being positive integers, p not a factor of n, and n not

a factor of p), the ratio p/n representing the ratio of the time required for transmission of data after compression to the time required for transmission of the same data before compression, comprising:

a first and a second memory having a common data input, forming the input of the device which receives the data to be compressed, the data being received as a sequence of packages of N data at a rate F_n, and having a common output forming the output of the device which sends the compressed data as a sequence of packages of N data at rate F_p; each said memory having a writing control input and a reading control input;

a control circuit having a first and a second input, and having four outputs connected respectively to the four control inputs of said memories and a fifth output;

a first frequency divider, by n, having an input receiving a first clock signal at frequency nFn, and an output connected to the first input of said control circuit for supplying thereto a second clock signal at frequency F_n;

a second frequency divider, by p, having an input receiving the first clock signal and having p outputs s_i (i being an integer varying from 0 to p−1) for delivering respectively p clock signals h_i at frequency F_p and whose respective phases ρ_i are such that

$$\rho i+1-\rho i=2\pi/p, \text{ for every i;}$$

a multiplexer having p inputs connected respectively to the p outputs of said second frequency divider, a control input, and an output connected to the second input of said control circuit;

means for controlling said multiplexer having an input connected to the fifth output of said control circuit and having an output connected to the control input of said multiplexer for supplying thereto a signal for selection of the clock signal h_i such that:

$$i=jN(n-p)\text{modulo } p$$

at each time t_0+jt_b, where j is a positive whole number, where t_0 is a time when the clock signal h_0 is in phase with said second clock signal and where t_b is the duration of a sequence of N data to be compressed.

4,428,064

CONTROLLING BUFFERED PERIPHERAL SUBSYSTEMS

Harry O. Hempy; Charles R. Kirkpatrick, and Francis L. Robinson, all of Tucson, all of Ariz., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Mar. 6, 1981, Ser. No. 241,286

Int. Cl.³ G11B *27/02*

U.S. Cl. 364—900 **7 Claims**

7. A buffered tape-recording peripheral system adapted to be connected to a host processor and having a plurality of magnetic tape recorders connected to a buffer, control means for transferring data from the magnetic tape recorder to said buffer before said host requests said data from said peripheral system but in anticipation of a further request by said host for data recorded on tape in said tape recorders,

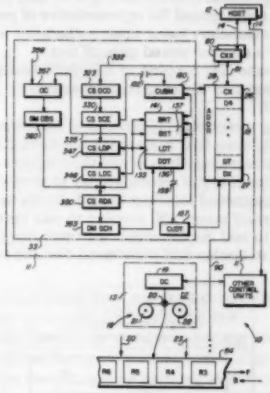
the improvement comprising:

means for indicating a predetermined change in future peripheral system actions with respect to a given one of said tape recorders and wherein certain data from said given one tape recorder presently resides in said buffer,

buffer control means connected to said buffer and to said indicating means responsive to said indication to purge said certain data from said buffer and having means indicating data stored in said buffer as a buffer status, and

tape control means connected to said given tape recorder and to said indicating means for responding to said indication to actuate said given tape recorder to reposition said tape in said given tape recorder so as to next read data on said tape corresponding to said certain data purged from said buffer by said buffer control means and which had resided in the buffer the longest of any such purged certain data command means connected to said host processor for receiving peripheral commands from the host processor for effecting command execution by said peripheral system;

recorder preparation means connected to said tape recorders and to said command means for preparing said tape recorders for said command execution and including means connected to said buffer control means for comparing a



received one of said command with said buffer status indicated by said buffer control means for determining whether or not data relating to said received predetermined one command is currently stored in said buffer as received from a one of said recorders, respectively; and

said indicating means being connected to said comparing means for being responsive to said comparison which indicates no need for data in the buffer for executing said received predetermined one of said command for supplying said indicating of said predetermined change.

4,428,065

DATA PROCESSING SYSTEM WITH MULTIPLE DISPLAY APPARATUS

William S. Duvall, Portola Valley, Calif., and William K. English, Tokyo, Japan, assignors to Xerox Corporation, Stamford, Conn.

Continuation of Ser. No. 52,992, Jun. 28, 1979, abandoned. This application Mar. 19, 1982, Ser. No. 360,036

Int. Cl.³ G06F *3/14, 7/24*

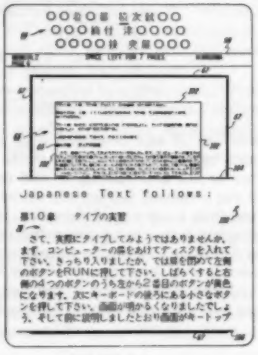
U.S. Cl. 364—900 **7 Claims**

1. A data processing system permitting the simultaneous display of two different images representing the same page of text but displayed in different font character sizes in different areas of a display and comprising:

(1) first storage means (64) for storing character font data representative of a first set of characters, each character of said first set being represented as a bit map of first predetermined dimensions;

(2) second storage means (90) for storing character font data representative of a second set of characters, each character of said second set corresponding to a character in said first set but being represented as a bit map of second predetermined dimensions of greater arbitrary scale than said first predetermined dimensions in order to provide more geometric detail of characters in said first set of characters, said second set character font data stored in said second storage means in numerically ordered character strikes with a predetermined number of characters per strike;

(3) third storage means (60) coupled to said first and second storage means for storing bit map representations of preselected of said first and second sets of characters, said preselected first set characters representative of a selected stored page of text and said preselected second set characters representative of a portion of or aspects of a corresponding stored page of text;
(4) fourth storage means (92) for storing pages of text, each page comprising a character identification list representative of said preselected firt set characters for each stored page of text and their position on each page,
(5) fifth storage means (76) for storing a bit map generation control list and a second list representative of preselected second set characters based upon a character identification list for a selected stored page of text,
(6) display means (24) coupled to said third storage means for displaying said bit map representations in a display area thereof;
(7) segmenting means (62, 78) coupled to said third storage means for defining first and second segments (DCB's) of said bit map representations in said third storage means to thereby define first and second display sections (66, 74 or 96) in predetermined locations of said display area;
(8) display control means (26) coupled to said third storage means and to said display means for controlling said display means to display said preselected first and second set



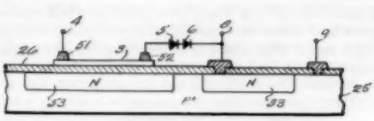
characters in said display area in accordance with the character font data stored in said bit map representations in said third storage means, said first display section (66) representing said preselected first set characters for a selected page of text, and said second display section (74 or 96) representing said preselected second set characters;
(9) data control means (CPU 10) coupled to said first, second, third, fourth and fifth storage means for controlling the processing and handling of character font data for a selected page of text, said data control means comprising
(i) means for accessing from said first storage means said preselected first set characters in their ordered visual display sequence in accordance with the character identification list for said selected page of text and for transferring said preselected first set characters from said first storage means into said first segment in said third storage means for display in said first display section;
(ii) means for creating said display bit map generation control list (FIG. 7) in said fifth storage means based upon said character identification list for said selected page of text, said control list representative of said preselected second set characters for said selected page of text and to be displayed in said second display section in their ordered visual display sequence;
(iii) means for sorting through said control list (FIG. 7) in said fifth storage means and rearranging said preselected second set characters in said control list into said second list (FIG. 8) representative of an ordered sequence in which said preselected second set characters appear in said second storage means in said numerically ordered character strikes;
(iv) means for examining said second list to generate character strike selection signals representative of said selected character strikes in said second storage means that have the character font data for all said preselected second set characters in said second list;
(v) means for selecting said preselected second set characters from each accessed, selected character strike and for transferring the selected of said preselected second set characters into said second segment in said third storage means for display in said second display section;
(10) transfer means (22) coupled to said data control means and said second and fifth storage means and responsive to said character strike selection signals from said data control means to sequentially access from said second storage means, in ascending order, selected character strikes;
(11) data buffer means (68, 70, 72) coupled to said data control means and to said second and third storage means to sequentially receive and store said selected character strikes accessed by said transfer means, and for transmitting the selected of said preselected second set characters into said second segment in said third storage means under the control of said data control means for display in said second display section.

4,428,066

SEMICONDUCTOR READ ONLY MEMORY

Kazuo Kihara, Tokyo, and Masashi Ikeda, Urawa, both of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Apr. 22, 1981, Ser. No. 256,666
Claims priority, application Japan, Jun. 2, 1980, 55-72726
Int. Cl.³ G11C *11/36*
U.S. Cl. 365—96 **5 Claims**



1. A semiconductor fused read only memory (ROM) comprising:
a substrate of a first conductivity type;
an insulator film formed on a surface of said substrate;
a plurality of doped regions cooperating with said substrate to form semiconductor elements;
a fuse resistor formed on said insulator film and connected in circuit with said semiconductor elements to form said memory;
an island region of a second conductivity type opposite to said first conductivity type, formed within said substrate and extending below all of said fuse resistor, said island region being defined by PN junctions from said substrate.

4,428,067

PRECHARGE FOR SPLIT ARRAY RATIOLESS ROM

Takashi Sakamoto, Tachikawa; Jinkichi Suto, Hamura, and Hisahiro Moriuchi, Koganei, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Aug. 6, 1981, Ser. No. 290,652
Claims priority, application Japan, Aug. 13, 1980, 55-110225
Int. Cl.³ G11C *17/00, 7/00*
U.S. Cl. 365—104 **10 Claims**

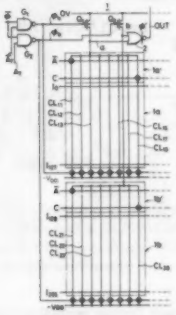
1. A semiconductor memory device comprising:
a first supply means which supplies a plurality of first input lines with first input signals;

a second supply means which supplies a plurality of second input lines with second input signals;

a first read-only memory which comprises a plurality of memory insulated-gate field effect transistors connected in series between a first output terminal and a first reference potential terminal and with their respective gates coupled to the corresponding first input lines;

a second read-only memory which comprises a plurality of memory insulated-gate field effect transistors connected in series between a second output terminal and said first reference potential terminal and with their respective gates coupled to the corresponding second input lines;

first precharge means, connected between a second reference potential terminal and said first output terminal including means for maintaining a first precharge signal in an "on" state when all said first input signals are made a second level, wherein said "on" state of said first pre-



charge signal brings enhancement-mode insulated-gate field effect transistors which are formed in said first read-only memory into an "on" state;

second precharge means connected between said second reference potential terminal and said second output terminal, including means for maintaining a second precharge signal in an "on" state when all said second input signals are made said second level;

means for making at least one of said first input signals a first level when any of said second input signals is not made a first level, said first level of said signal bringing an enhancement-mode insulated-gate field effect transistor which is formed in said first read-only memory into an "off" state, and

means for making at least one of said second input signals said first level when any of said first input signals is not made said first level.

4,428,068

IC WITH BUILT-IN ELECTRICAL QUALITY CONTROL FLAG

Fumio Baba, Kawasaki, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Filed Nov. 12, 1981, Ser. No. 320,541

Claims priority, application Japan, Nov. 13, 1980, 55-159871

Int. Cl.³ G11C *29/00;* **G01R** *31/28;* **H01L** *27/00*

U.S. Cl. 365—200 **13 Claims**

1. An apparatus associated with evaluation means, comprising:

interconnection means, semiconductor system means, and state identifying storage means physically associated with one another in accordance with system semiconductor technology and thus forming an entity;

said entity having first, second and third external terminals for connection to external apparatus;

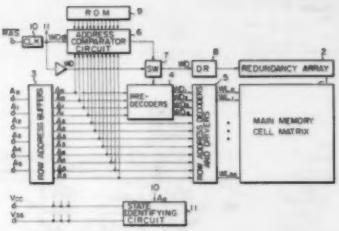
said interconnection means for connecting comprising:

means for operatively connecting said semiconductor system means to said first and second and third external terminals; and

means for connecting said state identifying storage means to the same said first, second and third external terminals;

said semiconductor system means for providing operations in accordance with its semiconductor construction, said operations being susceptible to evaluation as to operativeness;

said evaluation means for evaluating the state of operation as to operativeness of said semiconductor system means and



for establishing the state in said state identifying storage means in accordance therewith; and

said state identifying storage means, for storing the state of operation, being constructed such that the information stored therein may be read out only by detecting a conductance between said first and second external terminals, when external potentials are applied to each of said first and second external terminals at a first and second level, respectively, the difference between said first and second levels being relatively small and when an external potential is applied to said third external terminal at a third level higher than said first and second levels.

4,428,069

APPARATUS FOR PREFORMATTING AN OPTICAL DISK

Robert L. Hazel, and John E. Kammerud, both of Thousand Oaks, Calif., assignors to Burroughs Corporation, Detroit, Mich.

Filed Dec. 21, 1981, Ser. No. 333,055

Int. Cl.³ G11C *13/04*

U.S. Cl. 365—215 **8 Claims**

1. Apparatus for recording a predetermined pattern on an optical medium comprising:

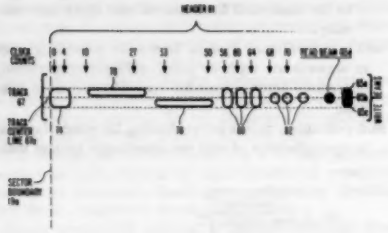
an optical radiation source for simultaneously providing at least first and second writing radiation beams of different wavelengths;

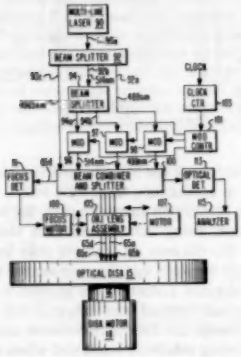
optical means for combining and focusing said beams onto said medium so that the focused spot of said first beam partially overlaps the focused spot of said second beam;

moving means for relatively moving the focused beams and said medium; and

modulating means for individually modulating each of said beams during relative movement of said beams and said medium so as to cause said writing beams to form said predetermined pattern on said medium;

said modulating means operating to simultaneously turn on both of said first and second beams during a first time





period and to turn on only one of said beams during a second time period.

4,428,070

DYNAMIC CIRCULATION MEMORY

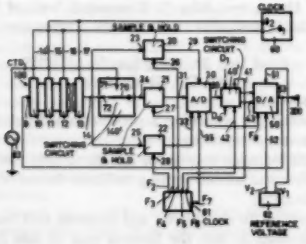
Arthur H. M. van Roermund, and Petrus M. C. Coppelmans, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Jun. 24, 1980, Ser. No. 162,693

Claims priority, application Netherlands, Jun. 28, 1979, 7905023; Sep. 14, 1979, 7906863

Int. Cl.³ G11C *7/00, 21/00*

U.S. Cl. 365—222 **5 Claims**



2. A dynamic circulation memory comprising

a charge transfer device including a semiconductor structure and means for reading out information,

first switching means connected in series with said charge transfer device for receiving signals therefrom,

first sample-and-hold circuit receiving signals from said first switching means, and second and third sample-and-hold circuits receiving signals from said charge transfer device,

an analog-to-digital converter receiving signals from said first, second and third sample-and-hold circuits,

second switching means receiving signals from said analog-to-digital converter, and

a digital-to-analog converter receiving signals from said second switching means and feeding signals to said charge transfer device.

4,428,071

INTEGRATED CIRCUIT HAVING NON-VOLATILE PROGRAMMABLE SEMICONDUCTOR MEMORIES

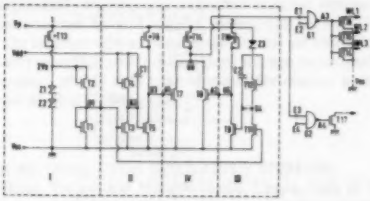
Klaus Wilmsmeyer, Denzlingen, Fed. Rep. of Germany, assignor to ITT Industries Inc., New York, N.Y.

Filed Nov. 16, 1981, Ser. No. 321,829

Claims priority, application Fed. Rep. of Germany, Nov. 27, 1980, 3044689

Int. Cl.³ G11C *7/00*

U.S. Cl. 365—226 **25 Claims**



1. In an integrated circuit including non-volatile programmable semiconductor memories in the form of storage transistors having threshold voltages which can be altered by a momentarily applied writing pulse of a programming voltage provided by an integrated programming logic circuit coupled to a source of supply voltage which is lower than said programming voltage, a supervisory circuit to detect at least a loss of said supply voltage comprising:

a first threshold switch integrated into said integrated circuit having its voltage supply terminal coupled to said programming voltage and another terminal coupled to a reference voltage source including at least one zener diode integrated into said integrated circuit having a reverse breakdown voltage available at an output point thereof; and

logic circuitry coupled to the output of said first threshold switch and to word lines of said integrated circuit to connect said word lines to a substrate zone of said programming logic when said supply voltage is lost.

4,428,072

SEISMIC WELL LOG DISPLAY METHOD AND APPARATUS

Samuel E. Johns, Jr., Fort Worth, Tex., assignor to Gearhart Industries Incorporated, Ft. Worth, Tex.

Filed Oct. 6, 1980, Ser. No. 194,238

Int. Cl.³ G01V *1/34*

U.S. Cl. 367—69 **6 Claims**

1. In a method of recording a display of recurrent seismic signals produced from a sonde moved by an electrical cable through a well bore, the steps comprising:

(a) transmitting said signals through said cable from said sonde to the earth's surface;

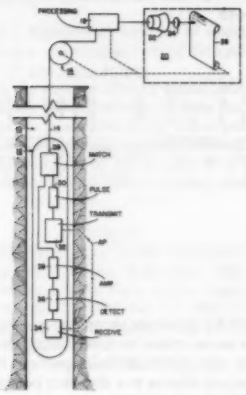
(b) repeatedly receiving each of said signals as a changing signal voltage;

(c) discriminating the polarity of slope of each said signal voltage;

(d) producing an intermittent recording voltage during a designated polarity of slope of said signal voltage as a

function of time, wherein said recording voltage is dichotomously modulated along a Z axis;

(e) displacing a chart record through a distance which is a function of the distance said sonde is moved through said bore hole; and



(f) recording each said recording voltage along a coordinate across said chart record as a dichotomous record located on said chart record in accordance with the position of said sonde within said well bore.

4,428,073

UNDERWATER DEPTH TELEMETRY

Peter W. Verburgt, Perkasie, Pa., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Nov. 2, 1981, Ser. No. 317,028
Int. Cl.³ H04B *11/00*
U.S. Cl. 367—134 **13 Claims**

1. An acoustic system for telemetering the underwater depth of a hydrographic package, comprising:

transducer means adapted to be mounted upon the hydrographic package for producing an analog signal indicative of the hydrostatic pressure exerted on the package and related to the underwater depth thereof;

converter means electrically coupled to said transducer means for converting the analog signal to an N-bit digital word;

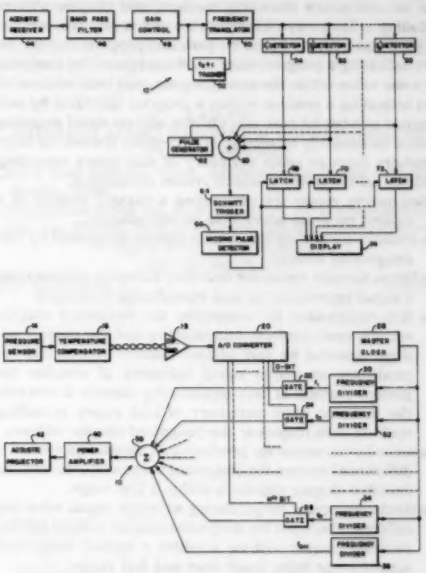
frequency synthesizer means electrically connected to said converter means for generating a composite acoustic signal digitally encoded in accordance with the N-bit digital word;

transmitter means electrically coupled to said frequency synthesizer means for acoustically projecting the composite signal underwater;

hydrophone means acoustically coupled to said transmitter means for receiving the composite signal under water;

frequency detector means electrically coupled to said hydrophone means for digitally decoding the composite acoustic signal to reproduce the N-bit digital word as an indication of the underwater depth; and

display means electrically connected to said frequency detector means for displaying the steady data state of the



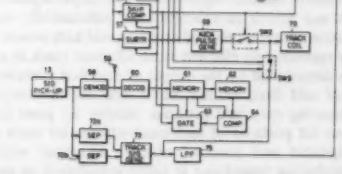
N-bit digital word as an indication of the underwater depth of the package.

4,428,074

HIGH-SPEED SEARCH SYSTEM IN A ROTARY RECORDING MEDIUM REPRODUCING APPARATUS

Ryozo Abe; Masaki Sakurai, both of Yokohama; Hiroyuki Sugiyama, Isehara; Yasuhiro Yusa, Fujisawa, and Kenji Yoshihara, Chiba, all of Japan, assignors to Victor Company of Japan, Ltd., Yokohama, Japan

Filed Sep. 11, 1981, Ser. No. 301,307
Claims priority, application Japan, Sep. 12, 1980, 55-126886
Int. Cl.³ G11B *21/02*
U.S. Cl. 369—32 **4 Claims**



1. A high-speed search system for an apparatus having a reproducing transducer, including a reproducing element for reproducing recorded signals from a rotary recording medium, and transferring means, including a motor, for transferring said reproducing transducer along a radial direction of said rotary recording medium, said rotary recording medium being recorded with an information signal and a chapter address signal on a spiral track thereof, said information signal recorded on

said rotary recording medium being divided into a plurality of programs identified by program numbers on said rotary recording medium, said chapter address signal indicating a position on said rotary recording medium, said chapter address including at least a synchronizing bit part, a program number bit part, and a local address bit part, said program number bit part indicating a program number of a program and assuming the same value within the same program, said local address bit part indicating a position within a program identified by said program number bit part, said chapter address signal assuming a value successively increasing or decreasing towards an inner periphery from an outer periphery of said rotary recording medium, said high-speed search system comprising:

designating means for designating a chapter address of a desired program which is to be reproduced;

a memory for storing the chapter address designated by said designating means;

address decoder means for decoding a chapter address from a signal reproduced by said reproducing transducer;

a first comparator for comparing the designated chapter address read out from said memory and the chapter address decoded by said address decoder means, and for producing an output signal indicative of whether the present position of said reproducing element is towards the inner or outer periphery of said rotary recording medium with respect to the designated chapter address;

a second comparator for producing an output signal when a difference between the designated chapter address and the decoded chapter address is within a first range;

a third comparator for producing an output signal when the difference between the designated chapter address and the decoded chapter address is within a second range, said second range being lower than said first range;

a fourth comparator for producing an output signal when the difference between the designated chapter address and the decoded chapter address is with in a third range, said third range being lower than said second range;

first control means, responsive to the output signals of said first and second comparators, for driving said motor to move said reproducing transducer at a first high speed in a direction determined by the output of said first comparator;

second control means, responsive to the output signals of said first and third comparators, for driving said motor to move said reproducing transducer at a second high speed in a direction determined by said first comparator, said second high speed being lower than said first high speed;

kick pulse generating means for generating kick pulses according to the difference between the designated chapter address and the decoded chapter address;

kick means for receiving said kick pulses and responsively kicking said reproducing element toward an adjacent track; and

third control means, responsive to the output signals of said first and fourth comparators, for substantially stopping rotation of said motor and enabling said kick means to kick said reproducing element to an adjacent track in a direction determined by the output of said first comparator,

each of said first, second, third, and fourth comparators comparing only said program number bit parts and first upper bit portions of said local address bit parts of said designated and decoded chapter addresses while said reproducing transducer is being transferred at said first high speed, and comparing only said upper bit portions and second upper bit portions of said local address bit parts of said designated and decoded chapter addresses while said reproducing transducer is being transferred at said second high speed,

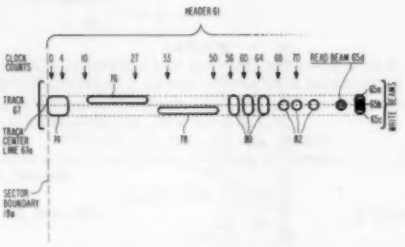
the transfer of said reproducing transducer and kicking of said reproducing element being stopped when lower bit portions of said local address bit parts of said chapter addresses coincide.

4,428,075

METHODS OF PREFORMATTING AN OPTICAL DISK

Robert L. Hazel, and John E. Kammerud, both of Thousand Oaks, Calif., assignors to Burroughs Corporation, Detroit, Mich.

Filed Dec. 21, 1981, Ser. No. 333,125
Int. Cl.³ G11B *7/00*
U.S. Cl. 369—45 **7 Claims**



1. A method for precisely recording to predetermined pattern in a track on an optical medium during a single pass of the track, wherein said pattern contains portions having different sizes and locations relative to a direction perpendicular to said track, said method comprising:

providing a single optical radiation source capable of providing radiation at at least first and second different wavelengths;

deriving at least first and second writing beams having said first and second wavelengths from said source;

combining and focusing said first and second writing beams onto said medium so that the focused spots formed by said beams on said medium are located along a line substantially perpendicular to said track such that the spot of one writing beam partially overlaps the spot of the other writing beam;

relatively moving said medium and said writing beams so that said focused spots move along said track; and

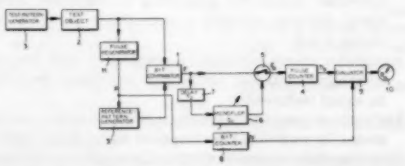
individually modulating said first and second writing beams while said spots are moving along said track so that both of said writing beams are simultaneously turned on during a first time period and only one of said beams is turned on during a second time period which is different from said first time period.

4,428,076

METHOD OF AND SYSTEM FOR EVALUATING BIT ERRORS IN TESTING A SIGNAL PATH

Eberhard Schuon, Eningen, Fed. Rep. of Germany, assignor to Wandel & Goltermann GmbH & Co., Eningen, Fed. Rep. of Germany

Filed Dec. 14, 1981, Ser. No. 330,719
Claims priority, application Fed. Rep. of Germany, Dec. 16, 1980, 3047239
Int. Cl.³ H04B *17/00*; H04L *1/00*
U.S. Cl. 371—5 **12 Claims**



1. A method of evaluating the bit-transmitting quality of a test object, comprising the steps of:

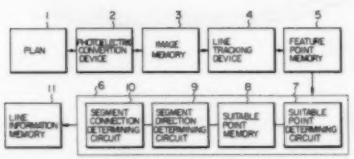
(a) feeding an original bit pattern of limited length, consisting of N bit cycles, to an input end of a test object;
(b) extracting a transmitted bit pattern from an output end of the test object;
(c) comparing a reference sequence identical with the original pattern bit by bit with the transmitted pattern and generating an error pulse upon detecting a disparity in any bit cycle;
(d) measuring a dependency interval of selected duration, encompassing a number $M << N$ of bit cycles, upon the occurrence of any error pulse;
(e) subtracting the number of error pulses occurring during any dependency interval of step (d) from the total number n of error pulses generated in step (c) to provide a count n_o of mutually independent error pulses; and
(f) dividing the count n_o by the number N of bit cycles to obtain a measure of said bit-transmitting quality.

4,428,077

LINE RECOGNITION METHOD

Shigeru Shimada, and Shigeru Kakumoto, both of Kodaira, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Aug. 27, 1980, Ser. No. 181,774
Claims priority, application Japan, Sep. 3, 1979, 54-111761; Sep. 5, 1979, 54-112876
Int. Cl.³ G06K 9/00
U.S. Cl. 382—9 **19 Claims**



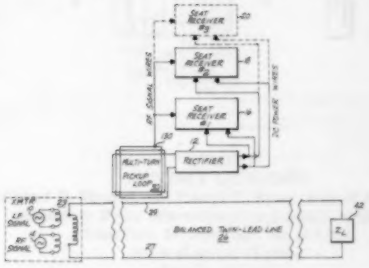
1. An automatic line recognition method capable of reading a dash or chain line comprising:
a first step of photoelectrically converting a pattern including a line plan consisting of a plurality of line segments separated by gaps and forming one or more dash or chain lines into a binary electrical signal and storing the signal in a first memory;
a second step of tracking each line segment based on said signal stored in the first memory and detecting at least the coordinates of the end points of each of the line segments of finite length, and forming tables, each for a respective line segment, in a second memory;
a third step of setting a certain range around one end point of a first line segment and searching the tables of other line segments so as to detect an end point of a second line segment among the end points of said other line segments present in said range which is spaced from and has a predetermined positional relationship with said first line segment; and
a fourth step of connecting the first and the second line segments across the gap between one end point of a first line segment and an end point of said second line segment by substituting the coordinates of said one end point with those of the end point of the second line segment.

4,428,078

WIRELESS AUDIO PASSENGER ENTERTAINMENT SYSTEM (WAPES)

Chyi J. Kuo, Bellevue, Wash., assignor to The Boeing Company, Seattle, Wash.

Continuation of Ser. No. 24,133, Mar. 26, 1979, abandoned, and Ser. No. 239,930, Mar. 3, 1981, abandoned. This application Aug. 9, 1982, Ser. No. 406,683
Int. Cl.³ H04B 5/00
U.S. Cl. 455—3 **2 Claims**

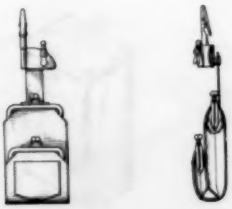


1. A passenger entertainment system for transmission by simultaneous inductive coupling of receiver power and intelligence information signals to a plurality of seat units disposed on a floor support, said system comprising:
transmitter means for generating said receiver power and intelligence information signals;
receiver means and power supply means for powering said receiver associated with each of said plurality of seat units;
a transmission line comprising a pair of spaced apart conductors coupled to said transmitter means, said pair of spaced apart conductors disposed substantially in the plane of said floor support;
a multiturn pick up loop disposed adjacent to said floor support, said multiturn pick up loop coupled to said receiver means and said power supply means; and,
wherein said receiver power signal has a frequency of around 20 KH_z, and said intelligence information signal has a frequency of around 40 MH_z.

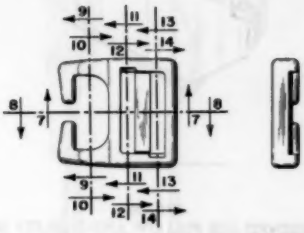
JANUARY 24, 1984

272,294
SPORT SHOE
Sigenobu Watanabe, Kobe, Japan, assignor to Asics Corporation, Kobe, Japan
Filed Mar. 5, 1981, Ser. No. 240,920
Term of patent 14 years
Int. Cl. D2—*04*
U.S. Cl. D2—309

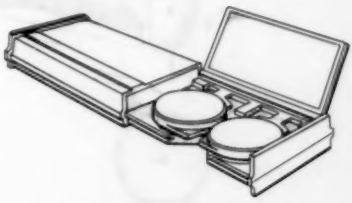
272,295
COMBINED CIGARETTE AND LIGHTER HOLDER
Willie Lewis, 1019 W. 106th St., Los Angeles, Calif. 90044
Filed Apr. 29, 1982, Ser. No. 372,976
Term of patent 14 years
Int. Cl. D02—*07*
U.S. Cl. D2—400



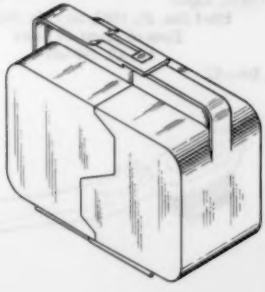
272,296
BUCKLE FOR SWIMMING MASK AND FOOT FINS
Tatsuhiko Ikeda, No. 22-2, Sengoku 4-chome, Bunkyo-ku, Tokyo-to, Japan
Filed Jan. 6, 1981, Ser. No. 222,956
Claims priority, application Japan, Jul. 16, 1980, 55-28372
Term of patent 14 years
Int. Cl. D02—*07*
U.S. Cl. D2—405



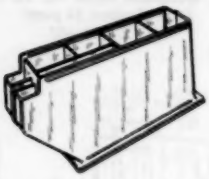
272,297
CONTACT LENS CASE
Michael D. Thomas, and Francis E. Ryder, both of Arab, Ala., assignors to Ryder International Corporation, Arab, Ala.
Filed Nov. 17, 1980, Ser. No. 207,266
Term of patent 14 years
Int. Cl. D3—*02*
U.S. Cl. D3—34



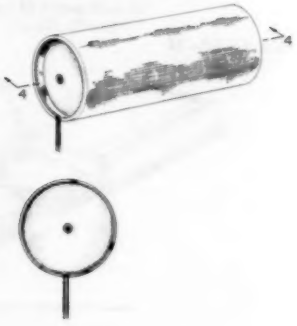
272,298
TAPE CASSETTE STORAGE AND CARRYING CASE
David M. Stravitz, 16 Park Ave. (Ste. 14A), New York, N.Y. 10016
Filed Apr. 27, 1981, Ser. No. 258,009
Term of patent 14 years
Int. Cl. D3—*02*
U.S. Cl. D3—35



272,299
AIRCRAFT CONSOLE
David L. Benson, 7474 Carmel La., Grand Ledge, Mich. 48837
Filed Feb. 9, 1981, Ser. No. 328,917
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D3—40

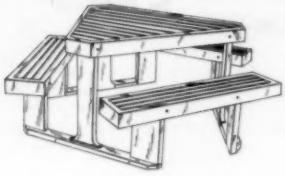


272,300
COMBINED AIR PILLOW AND UTILITY BAG
Leonard A. Dziurman, Jr., 14912 Newport Ave., Apt. E, Tustin, Calif. 92680
Filed Feb. 12, 1982, Ser. No. 348,292
Term of patent 14 years
Int. Cl. D3—*01*
U.S. Cl. D3—41

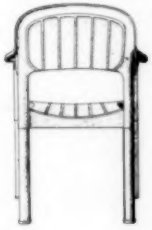


272,301
BRUSH
Tatsunosuke Itoh, Kashiwa, Japan, assignor to Tokyo Brush Co., Ltd., Tokyo, Japan
Filed Jan. 22, 1982, Ser. No. 341,695
Term of patent 14 years
Int. Cl. D4—*01*
U.S. Cl. D4—12

272,302
COMBINED TABLE AND MULTIPLE SEAT UNIT
Jerald L. Connelly, 2201 Hercules Dr., Colorado Springs, Colo. 80906
Filed Nov. 27, 1981, Ser. No. 325,352
Term of patent 14 years
Int. Cl. D6—*05*
U.S. Cl. D6—45

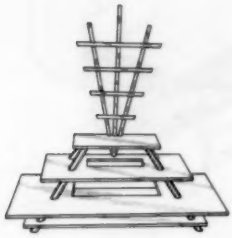


272,303
OUTDOOR ARMCHAIR
Didier Deconinck, Isere, France, assignor to Allibert S.A., Grenoble, France
Filed Nov. 2, 1981, Ser. No. 317,455
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—70

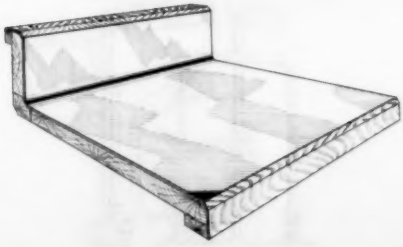


272,304
PEDESTAL HOUSING FOR CABLE TELEVISION COMPONENTS
Michael A. Palermo, 1165 S. Beecham Rd., and James L. Mason, 1169 S. Beecham Rd., both of Williamstown, N.J. 08094
Filed Feb. 17, 1981, Ser. No. 234,486
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—167

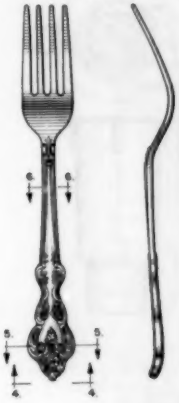
272,305
FLOWER STAND AND TRELLIS COMBINATION
Matti Pahlanen, Borrsvänggatan 9, Gothenburg, Sweden 412 61
Filed Dec. 8, 1981, Ser. No. 328,730
Claims priority, application Sweden, Jun. 11, 1981, 81-1349
Term of patent 14 years
Int. Cl. D6—*06*; D8—*99*
U.S. Cl. D6—183



272,306
CABINET TOP
William M. Kennedy, Marion, Ind., assignor to Hartson-Kennedy Cabinet Top Co., Inc., Marion, Ind.
Filed Aug. 3, 1981, Ser. No. 289,488
Term of patent 14 years
Int. Cl. D6—*06*
U.S. Cl. D6—192

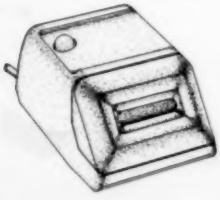


272,307
FORK OR SIMILAR ARTICLE
Oleg L. Cassini, New York, N.Y., assignor to American Home Products Corporation, New York, N.Y.
Filed Sep. 25, 1981, Ser. No. 305,597
Term of patent 14 years
Int. Cl. D07—*03*
U.S. Cl. D7—137

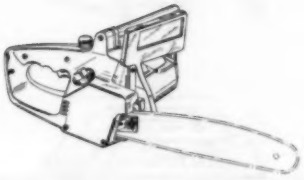


272,308
TEA INFUSER
Walter Schlessel, Lawrence, N.Y., assignor to Gemco Ware Inc., Freeport, N.Y.
Filed Mar. 13, 1981, Ser. No. 243,609
Term of patent 14 years
Int. Cl. D07—*04*
U.S. Cl. D7—400

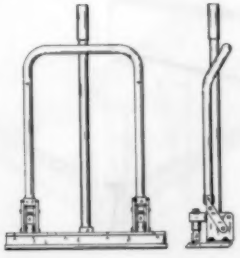
272,309
HOUSING FOR AN APPARATUS FOR CLEANING SOLDERING IRON TIPS
Ludwig Walser, Oberrohrdorf, Switzerland, assignor to Elvo Elektronik AG, Niederrohrdorf, Switzerland
Filed Nov. 9, 1981, Ser. No. 319,810
Claims priority, application Switzerland, Jun. 12, 1981, DM/000 808
Term of patent 14 years
Int. Cl. D8—*05*
U.S. Cl. D8—30



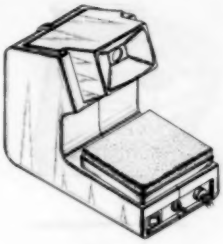
272,310
CHAIN SAW WITH BRAKE
Ernest R. Dynie, Brockville; Ian F. Norton, Toronto; Douglas G. Overbury, and Colin Overy, both of Brockville, all of Canada, assignors to Black & Decker Inc., Newark, Del.
Filed Nov. 19, 1980, Ser. No. 207,930
Term of patent 14 years
Int. Cl. D8—*03*
U.S. Cl. D8—65



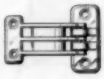
272,311
GRIPPER BAR
John T. Bell, St. Charles; Charles W. Ashby, Naperville, and Alfred Hamilton, Batavia, all of Ill., assignors to Container Corporation of America, Chicago, Ill.
Filed Mar. 16, 1981, Ser. No. 244,215
Term of patent 14 years
Int. Cl. D8—*05*
U.S. Cl. D8—71

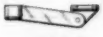


272,312
SOLDERING STATION HOUSING
William A. Lawrence, Palos Verdes Estates, Calif., assignor to Eldon Industries, Inc., Hawthorne, Calif.
Filed Aug. 3, 1981, Ser. No. 289,502
Term of patent 14 years
Int. Cl. D8—*05*
U.S. Cl. D8—71

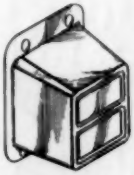


272,313
HINGE
Donald Jenkins, Louisiana, Mo., assignor to Astoria Fibra-Steel, Inc., Astoria, Ill.
Filed Dec. 17, 1981, Ser. No. 331,657
Term of patent 14 years
Int. Cl. D8—*06*
U.S. Cl. D8—329



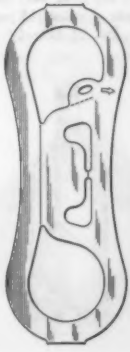


272,314
COVER FOR CYCLIC SUPPORT IN HELICOPTERS OR THE LIKE
Ronald A. Leibin, Westlake Village, and Stephen H. Crowe, Jr., Sylmar, both of Calif., assignors to Aeronautical Accessories, Inc., Bristol, Tenn.
Filed Oct. 30, 1981, Ser. No. 316,562
Term of patent 14 years
Int. Cl. D8—*09*; D12—*07*
U.S. Cl. D8—353

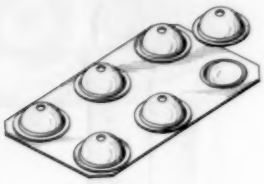


272,315
COMBINED HYDRAULIC CYLINDER SPRING AND FASTENERS THEREFOR
Veikko L. Valo, Box 29, SF-08101 Lohja 10, Finland
Filed Aug. 18, 1980, Ser. No. 178,719
Term of patent 14 years
Int. Cl. D8—*99*
U.S. Cl. D8—499

272,316
MULTIPLE CONTAINER CARRYING BAND OR THE LIKE
Leonard C. Braun, Bartlett, Ill., assignor to Illinois Tool Works Inc., Chicago, Ill.
Filed Aug. 19, 1981, Ser. No. 295,196
Term of patent 14 years
Int. Cl. D9—*99*
U.S. Cl. D9—344



272,317
MULTI-COMPARTMENTED PACKAGING CONTAINER FOR ICE CREAM OR THE LIKE
Christian Parmentier, 4, Avenue des Bouleaux, 44260-Savenay Malville, France
Filed Apr. 30, 1981, Ser. No. 260,096
Claims priority, application France, Dec. 18, 1980, 803913
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—345



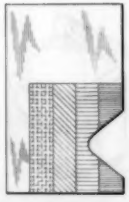
272,318
CONTAINER FOR LIQUIDS OR THE LIKE
Willem Visser, Schiedam, Netherlands, assignor to B.V. Verenigde Kunststof Bedrijven, Schiedam, Netherlands
Filed Aug. 25, 1981, Ser. No. 295,701
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—370

272,319
BOTTLE
Pierre Dourthe, Bordeaux, France, assignor to C.V.B.G., Bordeaux, France
Filed Mar. 23, 1981, Ser. No. 246,247
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—378

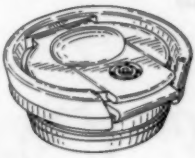
272,320
BOTTLE
Vincent E. Fortuna, Garden Grove, Calif., assignor to Cosden Technology, Inc., Dallas, Tex.
Filed Sep. 18, 1980, Ser. No. 188,479
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—389

272,321
BOTTLE
Edward J. Kretz, Toledo, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio
Filed Aug. 17, 1981, Ser. No. 293,715
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—389

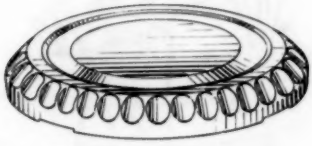
272,322
PACKING BOX
Kazumi Fujimoto, Hino, and Yoko Takeda, Tokyo, both of Japan, assignors to Sony Corporation, Tokyo, Japan
Filed Mar. 5, 1981, Ser. No. 240,886
Claims priority, application Japan, Sep. 19, 1980, 55-038763
Term of patent 14 years
Int. Cl. D7—*03*
U.S. Cl. D9—432



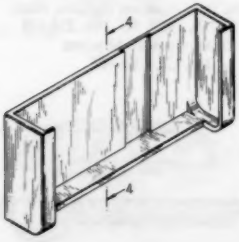
272,323
CONTAINER CLOSURE
Donald J. Bainton, Greenwich, Conn., assignor to The Continental Group, Inc., New York, N.Y.
Filed Sep. 21, 1981, Ser. No. 303,805
Term of patent 14 years
Int. Cl. D9—*07*
U.S. Cl. D9—438



272,324
CLOSURE CAP OR THE LIKE
Orris E. Mumford, and John F. Hollingsworth, both of Lancaster, Ohio, assignors to Anchor Hocking Corporation, Lancaster, Ohio
Filed Jul. 2, 1981, Ser. No. 279,769
Term of patent 14 years
Int. Cl. D9—*07*
U.S. Cl. D9—452



272,325
CLOCK HOLDERS
Leung Y. Sze, Kowloon, Hong Kong, assignor to Hybrid Electronics Associates Ltd., Hong Kong, Hong Kong
Filed Nov. 10, 1981, Ser. No. 320,081
Claims priority, application United Kingdom, May 15, 1981, 811000503
Term of patent 14 years
Int. Cl. D10—*07*
U.S. Cl. D10—128

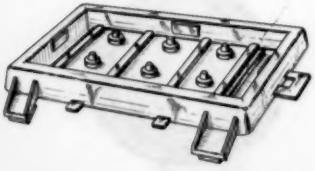


272,326
RING
Marina Bulgari, Athens, Greece, assignor to Zoldia Anstalt, Vaduz, Liechtenstein
Filed Nov. 18, 1980, Ser. No. 207,985
Claims priority, application Italy, May 27, 1980, 35781 B/80[U]
Term of patent 14 years
Int. Cl. D11—*01*
U.S. Cl. D11—34

272,327
EARRING FACE
Marina Bulgari, Athens, Greece, assignor to Zoldia Anstalt, Vaduz, Liechtenstein
Filed Feb. 9, 1981, Ser. No. 232,803
Claims priority, application Italy, Aug. 13, 1980, 35958/80[U]
Term of patent 14 years
Int. Cl. D11—*01*
U.S. Cl. D11—75

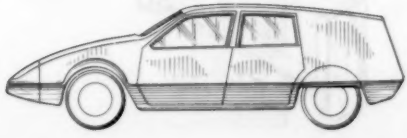
272,328
HANGING DECORATION IN THE FORM OF A MINIATURE FOOTBALL UNIFORM
Brigitte Breyer, Bahnhofplatz 5, 8045 Ismaning, Fed. Rep. of Germany
Division of Ser. No. 964,017, Nov. 27, 1978. This application Aug. 20, 1980, Ser. No. 180,057
Term of patent 14 years
Int. Cl. D11—*02*
U.S. Cl. D11—184

272,329
FLORAL DISPLAY SUPPORT
Jack H. Clemmons, Jr., Greensboro, N.C., assignor to KCJ Manufacturing Corp., Greensboro, N.C.
Filed Jul. 22, 1981, Ser. No. 285,758
Term of patent 14 years
Int. Cl. D11—*02*
U.S. Cl. D11—147

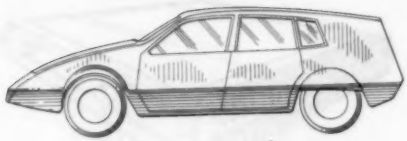


272,330
HANGING ORNAMENT
Brigitte Breyer-Lindner, Bahnhofplatz 5, 8045 Ismaning, Fed. Rep. of Germany
Filed Sep. 10, 1981, Ser. No. 301,005
Claims priority, application Fed. Rep. of Germany, Mar. 19, 1981, 11 AR 825/81
Term of patent 14 years
Int. Cl. D11—*05*
U.S. Cl. D11—133

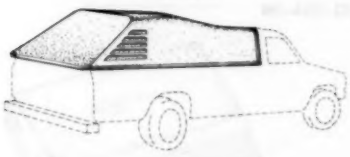
272,331
MOTOR VEHICLE
Jack J. Ritchie, Washington, Mich., assignor to Energy Development Associates, Inc., Madison Heights, Mich.
Filed Dec. 8, 1980, Ser. No. 214,678
Term of patent 14 years
Int. Cl. D12—*08*
U.S. Cl. D12—91



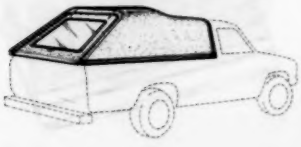
272,332
MOTOR VEHICLE
Jack J. Ritchie, Washington, Mich., assignor to Energy Development Associates, Inc., Madison Heights, Mich.
Continuation-in-part of Ser. No. 214,678, Dec. 8, 1980. This application Jul. 27, 1981, Ser. No. 287,509
Term of patent 14 years
Int. Cl. D12—*08*
U.S. Cl. D12—91



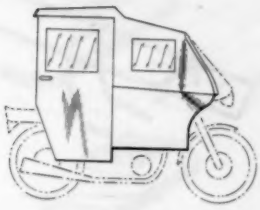
272,333
HATCH-BACK COVER FOR THE BED OF A PICK-UP TRUCK
O. Eugene Potterbaum, Elkhart; Jerry Weaver, Mishawaka, and Steven D. Stutz, Elkhart, all of Ind., assignors to Galaxie Corporation, Bristol, Ind.
Filed Jul. 28, 1980, Ser. No. 173,094
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D12—156



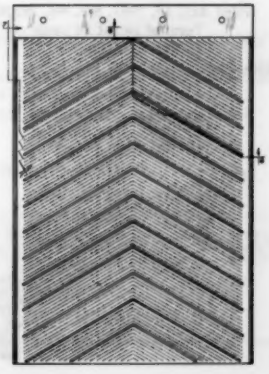
272,334
HATCH-BACK COVER FOR THE BED OF A PICK-UP TRUCK
O. Eugene Potterbaum, Elkhart; Jerry Weaver, Mishawaka, and Steven D. Stutz, Elkhart, all of Ind., assignors to Galaxie Corporation, Bristol, Ind.
Filed Jul. 28, 1980, Ser. No. 173,095
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D12—156



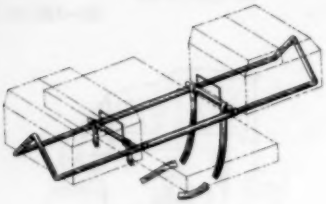
272,335
MOTORCYCLE ENCLOSURE
Greg A. Bauer, 419 E. Water, Apt. 2, Pontiac, Ill. 61764
Filed Apr. 30, 1981, Ser. No. 259,253
Term of patent 14 years
Int. Cl. D12—*11*
U.S. Cl. D12—156



272,336
SPLASH GUARD FOR AUTOMOTIVE VEHICLE
Robert E. Lightle; James R. Lockwood, both of Wapakoneta; Douglas F. Busch, and Michael B. Mosholder, both of Columbus, all of Ohio, assignors to Lancaster Colony Corporation, Columbus, Ohio
Filed Jul. 27, 1981, Ser. No. 287,224
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D12—185

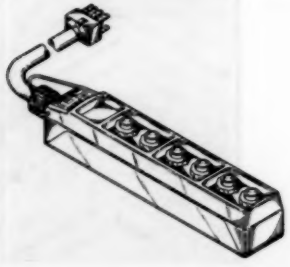


272,337
TACKLE BOX HOLDER
Arthur J. Mondak, 7142 Big Creek Pkwy., and William J. Mondak, 7335 Engle Rd., both of Middleburg Heights, Ohio 44130
Filed Jul. 29, 1981, Ser. No. 288,057
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D12—317

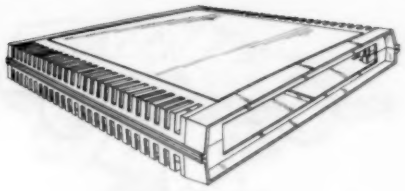


272,338
ELECTRICAL BOX COVER
Anatolio Bergoltz, 4969 Ossorio St., Buenos Aires, Argentina
Filed Apr. 12, 1979, Ser. No. 30,089
Term of patent 14 years
Int. Cl. D13—*03*
U.S. Cl. D13—35

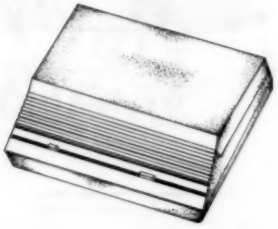
272,339
PENDANT CONTROL STATION
William D. Penland, Weaverville, and Jackie C. Sullivan, Asheville, both of N.C., assignors to Square D Company, Palatine, Ill.
Filed Aug. 17, 1981, Ser. No. 293,823
Term of patent 14 years
Int. Cl. D13—*03*
U.S. Cl. D13—38

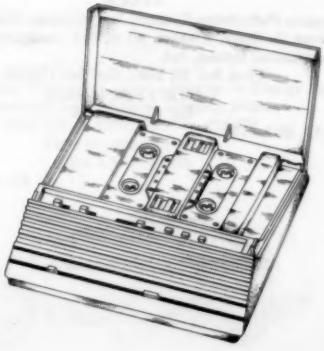


272,340
HOUSING FOR PRINTED CIRCUIT BOARDS
James L. Korzik, Palm Harbor, Fla., assignor to Paradyne Corporation, Largo, Fla.
Filed May 11, 1981, Ser. No. 262,683
Term of patent 14 years
Int. Cl. D13—*03*; D14—*02*
U.S. Cl. D13—41

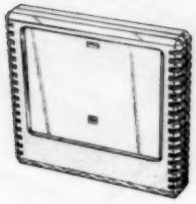


272,341
TELEPHONE ANSWERING UNIT
Arthur T. Martinez, Long Beach, Calif., assignor to T.A.D. Avanti, Inc., Compton, Calif.
Filed Sep. 25, 1981, Ser. No. 305,467
The portion of the term of this patent subsequent to Sep. 14, 1996, has been disclaimed.
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D14—04

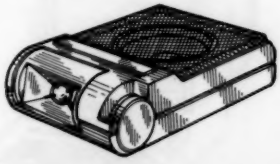




272,342
CARTRIDGE FOR VIDEO GAME UNIT
Regan L. Cheng, San Jose, Calif., assignor to Atari, Inc., Sunnyvale, Calif.
Filed Jan. 7, 1982, Ser. No. 337,885
Term of patent 14 years
Int. Cl. D14—*01*
U.S. Cl. D14—11

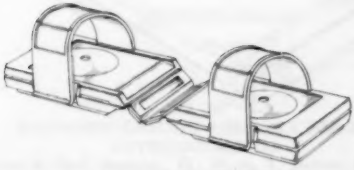


272,343
LOUDSPEAKER
Hideyuki Matsubara, Tokyo, Japan, assignor to Pioneer Kabushiki Kaisha, Tokyo, Japan
Filed Sep. 14, 1981, Ser. No. 301,573
Claims priority, application Japan, Mar. 13, 1981, 56-10423
Term of patent 14 years
Int. Cl. D14—*01*
U.S. Cl. D14—34



272,344
EXPANSIBLE COMPACT TELEPHONE
William G. MacKenzie, Middletown, N.J., assignor to International Telephone and Telegraph Corporation, New York, N.Y.
Division of Ser. No. 70,933, Aug. 29, 1979, Pat. No. Des. 264,465. This application Nov. 12, 1981, Ser. No. 320,371
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D14—53

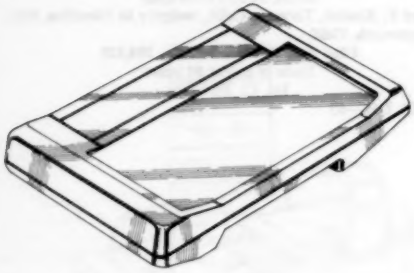
272,345
ACOUSTIC COUPLER
Bayard F. Kessler, Tarzana, Calif., assignor to Novation, Inc., Chatsworth, Calif.
Filed Aug. 3, 1981, Ser. No. 289,329
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D14—57



272,346
PUSHBUTTON DIAL FOR A TELEPHONE SET OR THE LIKE
John E. Kaczkos, Elk Grove Village, Ill., assignor to GTE Automatic Electric Labs Inc., Northlake, Ill.
Filed Nov. 16, 1981, Ser. No. 322,092
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D14—66

272,347
PUSHBUTTON DIAL FOR A TELEPHONE SET OR THE LIKE
John E. Kaczkos, Elk Grove Village, Ill., assignor to GTE Automatic Electric Labs Inc., Northlake, Ill.
Filed Nov. 16, 1981, Ser. No. 322,093
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D14—66

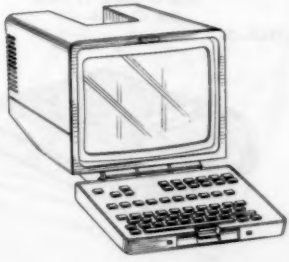
272,348
CASE FOR A KEYBOARD AND DISPLAY UNIT
Roman Y. Gonzales, Andover, Mass.; Jay M. Prager, Nashua, N.H., and Charles M. Ault, Winchester, Mass., assignors to Gould Inc., Rolling Meadows, Ill.
Filed Jun. 13, 1981, Ser. No. 224,793
Term of patent 14 years
Int. Cl. D14—*02*
U.S. Cl. D14—100



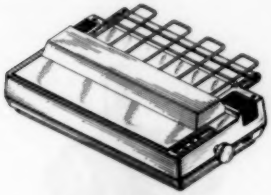
272,349
COMPUTER
Richard J. Dickinson, Huntingdon, England, assignor to Sinclair Research Limited, Cambridge, England
Filed Aug. 21, 1981, Ser. No. 295,020
Claims priority, application United Kingdom, Feb. 22, 1981, 999098
Term of patent 14 years
Int. Cl. D14—*02*
U.S. Cl. D14—100

272,350
CONSOLE UNIT FOR DATA COMMUNICATION
Kazuo Unno; Kengo Suzuki; Hirotomo Ito, and Takao Sekiguchi, all of Tokyo, Japan, assignors to Oki Electric Industry Co., Ltd., Tokyo, Japan
Filed Mar. 20, 1981, Ser. No. 245,889
Claims priority, application Japan, Oct. 8, 1980, 55-41583
Term of patent 14 years
Int. Cl. D14—*02*
U.S. Cl. D14—101

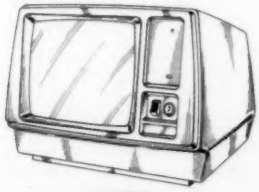
272,351
DATA TRANSMISSION TERMINAL
Michel Moraine, Boersch, France, assignor to La Telephonie Industrielle et Commerciale, Strasbourg, France
Filed Jun. 19, 1981, Ser. No. 275,301
Claims priority, application France, Mar. 13, 1981, 810939
Term of patent 14 years
Int. Cl. D14—*02*
U.S. Cl. D14—106



272,352
ELECTRONIC PRINTER
Haruyuki Seki, and Chiaki Kuroiwa, both of Shiojiri, Japan, assignors to Epson Corporation, Nagano and Kabushiki Kaisha Suwa Seikosha, Tokyo, both of, Japan
Filed Jul. 14, 1981, Ser. No. 282,995
Claims priority, application Japan, Feb. 12, 1981, 56-5178
Term of patent 14 years
Int. Cl. D14—*02*
U.S. Cl. D14—111

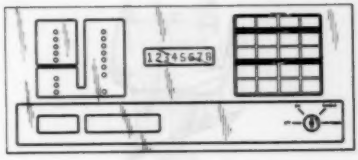


272,353
VIDEO TERMINAL OR SIMILAR ARTICLE
Richard R. Dillon, Wellesley, Mass., assignor to Honeywell Information Systems Inc., Waltham, Mass.
Filed May 22, 1979, Ser. No. 41,444
Term of patent 14 years
Int. Cl. D14—*02*
U.S. Cl. D14—113

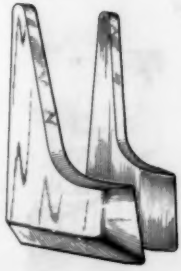


272,354
CRT DISPLAY CABINET
Donald M. Genaro, Haworth, and Alvin R. Tilley, Red Bank, both of N.J., assignors to Teletype Corporation, Skokie, Ill.
Filed Nov. 23, 1981, Ser. No. 324,334
Term of patent 14 years
Int. Cl. D14—*02*
U.S. Cl. D14—113

272,355
DATA TRANSMISSION MULTIPLEXER CONTROL PANEL
Vasant H. Acharya; Douglas L. Manchester, and Gilbert S. Hunt, all of Santa Clara County, Calif., assignors to Halcyon, Inc., San Jose, Calif.
Filed Sep. 10, 1981, Ser. No. 301,016
Term of patent 14 years
Int. Cl. D14—*02*; D13—*03*
U.S. Cl. D14—115



272,356
MOUNTING BRACKET ASSEMBLY FOR AN OUTBOARD MOTOR
Charles B. Hall, Ingleside, Ill.; Myron T. Stevens, Kenosha, Wis., and Paul B. Specht, Wilmette, Ill., assignors to Outboard Marine Corporation, Waukegan, Ill.
Filed Sep. 3, 1981, Ser. No. 299,150
Term of patent 14 years
Int. Cl. D15—*99*
U.S. Cl. D15—4



272,357

COMBINED OUTBOARD MOTOR AND MOUNTING BRACKET ASSEMBLY THEREFOR

Charles B. Hall, Ingleside, Ill.; Myron T. Stevens, Kenosha, Wis., and Paul B. Specht, Wilmette, Ill., assignors to Outboard Marine Corporation, Waukegan, Ill. and Outboard Marine Corporation, Waukegan, Ill.

Filed Sep. 3, 1981, Ser. No. 299,151

Term of patent 14 years

Int. Cl. D15—*01, 01*

U.S. Cl. D15—4

272,358

COMBINED OUTBOARD MOTOR AND MOUNTING BRACKET ASSEMBLY THEREFOR

Charles B. Hall, Ingleside, Ill.; Myron T. Stevens, Kenosha, Wis., and Paul B. Specht, Wilmette, Ill., assignors to Outboard Marine Corporation, Waukegan, Ill.

Filed Sep. 3, 1981, Ser. No. 299,152

Term of patent 14 years

Int. Cl. D15—*01*

U.S. Cl. D15—4

272,359

MOUNTING BRACKET ASSEMBLY FOR AN OUTBOARD MOTOR

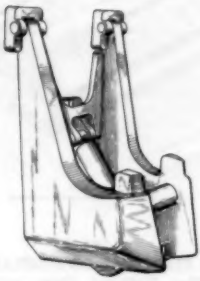
Charles B. Hall, Ingleside, Ill.; Myron T. Stevens, Kenosha, Wis., and Paul B. Specht, Wilmette, Ill., assignors to Outboard Marine Corporation, Waukegan, Ill.

Filed Sep. 3, 1981, Ser. No. 299,154

Term of patent 14 years

Int. Cl. D15—*99*

U.S. Cl. D15—4



272,360

X-RAY-FILM-PROCESSOR

Norbert Schlagheck, Fuerstenfeldbruck, and Lutz Rabold, Söcking, both of Fed. Rep. of Germany, assignors to AGFA-Gevaert AG, Leverkusen, Fed. Rep. of Germany

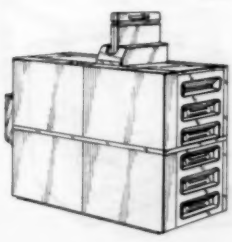
Filed Dec. 12, 1980, Ser. No. 216,605

Claims priority, application Fed. Rep. of Germany, Jun. 12, 1980, G175804

Term of patent 14 years

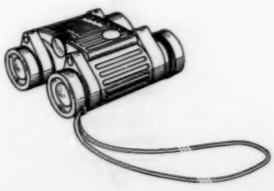
Int. Cl. D16—*03*

U.S. Cl. D16—34



272,361
BINOCULAR
Alfred Hengst, Lahnau; Heinrich Janke, Braunfels; Hans-Kurt Uellenberg, Edingen, and Heinz Keiner, Solms, all of Fed. Rep. of Germany, assignors to Ernst Leitz Wetzlar GmbH, Wetzlar, Fed. Rep. of Germany
Filed Sep. 25, 1981, Ser. No. 305,707
Claims priority, application Fed. Rep. of Germany, Apr. 10, 1981, 5 MR 222
Term of patent 14 years
Int. Cl. D16—*06*
U.S. Cl. D16—132

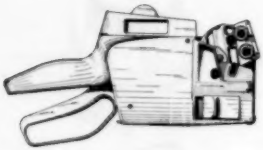
272,362
BINOCULAR
Alfred Hengst, Lahnau; Heinrich Janke, Braunfels; Hans-Kurt Uellenberg, Edingen, and Heinz Keiner, Solms, all of Fed. Rep. of Germany, assignors to Ernst Leitz Wetzlar GmbH, Wetzlar, Fed. Rep. of Germany
Filed Sep. 25, 1981, Ser. No. 305,709
Claims priority, application Fed. Rep. of Germany, Apr. 10, 1981, 5 MR 222
Term of patent 14 years
Int. Cl. D16—*06*
U.S. Cl. D16—133



272,363
COMBINED DECORATION STAMP AND CAP
Kazushige Matsumuro, Otsu, Japan, assignor to The Sailor Pen Co., Ltd., Tokyo, Japan
Filed Dec. 29, 1981, Ser. No. 335,538
Term of patent 14 years
Int. Cl. D19—*02*
U.S. Cl. D18—16

272,364
COMBINED DECORATION STAMP AND CAP
Kazushige Matsumuro, Otsu, Japan, assignor to The Sailor Pen Co., Ltd., Tokyo, Japan
Filed Dec. 29, 1981, Ser. No. 335,539
Term of patent 14 years
Int. Cl. D19—*02*
U.S. Cl. D18—16

272,365
LABELLING APPARATUS
Werner Becker, Hirschhorn; Heinrich Volk, Beerfelden-Gammelsbach, and Heinz Kistner, Neckarsteinach, all of Fed. Rep. of Germany, assignors to Easelte Pendaflex Corporation, Garden City, N.Y.
Filed Sep. 30, 1981, Ser. No. 307,309
Claims priority, application Switzerland, Apr. 18, 1981, 111726
Term of patent 14 years
Int. Cl. D18—99
U.S. Cl. D18—19

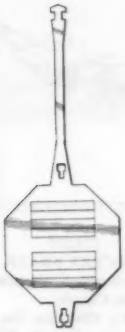


272,366
ELECTRONIC TEACHING AID
Lawrence J. Greenberg, 43 Wilputte Pl., New Rochelle, N.Y. 10804, and Gregory E. Hyman, 12 Chester Pl., Bronxville, N.Y. 10708
Filed Dec. 14, 1981, Ser. No. 330,218
Term of patent 14 years
Int. Cl. D19—07
U.S. Cl. D19—60

272,367
COIN ENTRY DEVICE
William Bartlett, Florissant, Mo., assignor to Coin Acceptors, Inc., St. Louis, Mo.
Filed Nov. 16, 1981, Ser. No. 321,383
Term of patent 14 years
Int. Cl. D20—01
U.S. Cl. D20—9

272,368
LUGGAGE TAG OR SIMILAR ARTICLE
Jacques Fontaine, Paris, France, assignor to Societe a Responsabilite Limitee Dite: Translabel
Filed Mar. 15, 1982, Ser. No. 358,037
Term of patent 14 years
Int. Cl. D20—99
U.S. Cl. D20—27

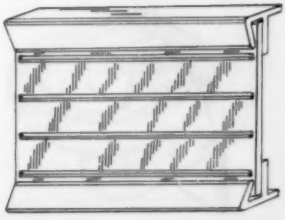
272,369
LUGGAGE TAG OR SIMILAR ARTICLE
Jacques Fontaine, Paris, France, assignor to Societe a Responsabilite Limitee Dite: Translabel
Filed Mar. 15, 1982, Ser. No. 358,280
Term of patent 14 years
Int. Cl. D20—*99*
U.S. Cl. D20—27



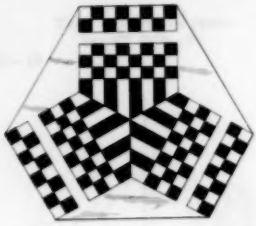
272,370
LUGGAGE TAG OR SIMILAR ARTICLE
Jacques Fontaine, Paris, France, assignor to Societe a Responsabilite Limitee Dite: Translabel, Puteaux, France
Filed Mar. 15, 1982, Ser. No. 358,281
Term of patent 14 years
Int. Cl. D20—*99*
U.S. Cl. D20—27

272,371
LUGGAGE TAG OR SIMILAR ARTICLE
Jacques Fontaine, Paris, France, assignor to Societe a Responsabilite Limitee Dite: Translabel, Puteaux, France
Filed Mar. 15, 1982, Ser. No. 358,282
Term of patent 14 years
Int. Cl. D20—*99*
U.S. Cl. D20—28

272,372
SIGN WITH CHANNELS FOR MOVEABLE CHARACTER PLATES
Ralph Kutschmende, 395 Manhattan Ave., Brooklyn, N.Y. 11211
Filed Feb. 9, 1981, Ser. No. 232,912
Term of patent 14 years
Int. Cl. D20—*03*
U.S. Cl. D20—42



272,373
CHESS GAME BOARD OR SIMILAR ARTICLE
Lucien M. Kowal, 356 Amboy Ave., Woodbridge, N.J. 07095
Filed Jan. 18, 1982, Ser. No. 340,238
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—24



272,374
MODULAR CHESS SET PIECE
Robert R. Keegan, 1825 Susan Dr., Fayetteville, Ark. 72701
Division of Ser. No. 628,475, Nov. 5, 1975, Pat. No. 4,234,188.
This application Jul. 21, 1980, Ser. No. 170,949
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—52

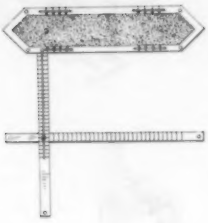
272,375
SAFETY PAD FOR USE WITH BARBELL OR SIMILAR ARTICLE
Barney R. Fuller, Sr., 15605 Singapore La., Houston, Tex. 77040
Filed Dec. 15, 1981, Ser. No. 330,990
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D21—191

272,376
EXERCISE MACHINE
Ian J. Cunnington, 5 Paddock End, Grouville, Jersey, Channel Islands, and Paul N. Rainey, 47 Fairfield Rd., Kingston upon Thames, England
Filed Apr. 15, 1981, Ser. No. 254,538
Claims priority, application United Kingdom, Oct. 20, 1980, 80997154
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D21—72

272,377
HOCKEY SKATE
Philip V. Chiarella, Westmount, Canada, assignor to Gamebridge Inc., St. Jerome, Canada
Filed Aug. 11, 1981, Ser. No. 291,940
Claims priority, application Canada, Feb. 16, 1981, 1602812
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D21—225

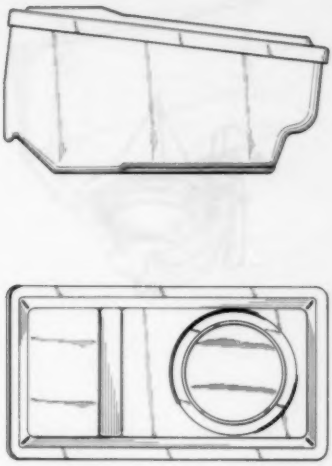
272,378
BILLIARD BALL RACK
William D. Cayton, 25 Myrtle Blvd., Larchmont, N.Y. 10538
Filed May 18, 1981, Ser. No. 264,603
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D21—232

272,379
GOLF STANCE AND SWING PRACTICE DEVICE OR THE LIKE
Richard H. Cachola, Detroit, Mich., assignor to Michael J. Piperides, Warren, Mich., a part interest
Continuation-in-part of Ser. No. 280,824, Jul. 6, 1981. This application Dec. 21, 1981, Ser. No. 332,956
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—234



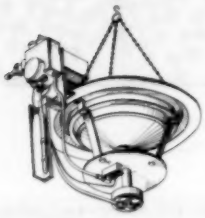
272,380
LIQUID SPRAYER
Tit-Wing Poon, 12F Lam Uk Village, Chaiwan, Hong Kong
Filed Aug. 6, 1981, Ser. No. 290,639
Claims priority, application United Kingdom, Apr. 27, 1981, 811 000 155
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—18

272,381
CASSETTE FOR A SEWERLESS TOILET
William R. Bocchini, Wyckoff, and Brian Wilcockson, Long Beach Island, both of N.J., assignors to American Standard Inc., New York, N.Y.
Filed Nov. 12, 1981, Ser. No. 320,272
Term of patent 14 years
Int. Cl. D23—*02*
U.S. Cl. D23—48

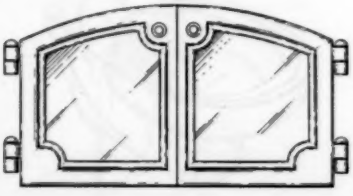


272,382
BIDET
Hertha A. Bengtson, Mölle, Sweden, assignor to American Standard Inc., New York, N.Y.
Division of Ser. No. 70,272, Aug. 27, 1979. This application May 26, 1981, Ser. No. 267,208
Claims priority, application Fed. Rep. of Germany, Mar. 22, 1979, 20AR250
Term of patent 14 years
Int. Cl. D23—*02*
U.S. Cl. D23—51

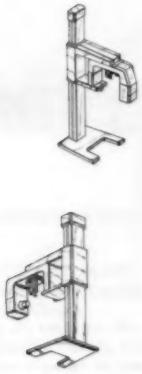
272,383
GAS FIRED POULTRY BROODER WITH CERAMIC-TYPE RADIANT
William H. Johnson, Harrisonburg, Va., assignor to Shenandoah Manufacturing Co., Inc., Harrisonburg, Va.
Filed Oct. 14, 1981, Ser. No. 351,464
Term of patent 14 years
Int. Cl. D23—*03*
U.S. Cl. D23—80



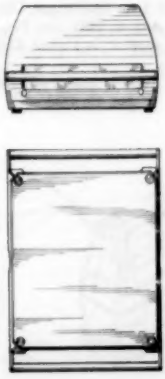
272,384
STOVE DOORS AND HINGES THEREFOR
Kurt W. F. Rumens, 5005 Phinney Ave. N., Apt. No. 202, Seattle, Wash. 98103
Filed Feb. 17, 1981, Ser. No. 229,051
Term of patent 14 years
Int. Cl. D23—*03*
U.S. Cl. D23—128



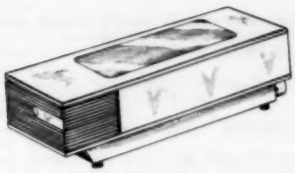
272,385
X-RAY APPARATUS FOR DENTAL WHOLE JAW
Kozo Nakano, Kyoto, and Kazuo Nishikawa, Yawata, both of Japan, assignors to Kabushiki Kaisha Morita Seisakusho, Kyoto, Japan
Filed Dec. 5, 1980, Ser. No. 213,509
Claims priority, application Japan, Jun. 18, 1980, 55-24343
Term of patent 14 years
Int. Cl. D24—*01*
U.S. Cl. D24—02



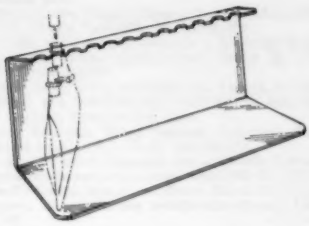
272,386
RECTANGULAR GAMMA CAMERA HEAD WITH COLLIMATOR
Edward A. Kroll, Chardon, and Allan J. Perwsek, Mentor, both of Ohio, assignors to Technicare Corporation, Solon, Ohio
Filed May 4, 1981, Ser. No. 260,239
Term of patent 14 years
Int. Cl. D24—*01*
U.S. Cl. D24—02



272,387
LASER
Earl E. Hoyt, Franklin Lakes, N.J., assignor to Allied Corporation, Morris Township, Morris County, N.J.
Filed Sep. 9, 1982, Ser. No. 416,200
Term of patent 14 years
Int. Cl. D24—*01, 02*
U.S. Cl. D24—8



272,388
SUPPORTING STAND FOR AN INTRAVENOUS SOLUTION BAG FOR MEDICAL LIQUIDS
Kenneth E. Wilkinson, Round Lake, Ill., assignor to Abbott Laboratories, North Chicago, Ill.
Filed Aug. 6, 1981, Ser. No. 290,453
Term of patent 14 years
Int. Cl. D24—*02*; D6—*06*
U.S. Cl. D24—31



LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 24TH DAY OF JANUARY, 1984

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

A. P. Besson Limited: *See*—
Charlesworth, David V.; and Smith, Derek F., 4,427,958, Cl. 335-231.000.

A-Yan, Kuo. Method for manufacture of feather quilt. 4,426,945, Cl. 112-262.100.

Abbes, Claude; Rousud, Christian; Piednoir, Robert; and De Villepoix, Raymond, to Commissariat a l'Energie Atomique. Device for the tight joining of two parts. 4,427,222, Cl. 285-353.000.

Abbott Laboratories: *See*—
Tadanier, John S.; Hallas, Robert; Freiberg, Leslie A.; and Bacino, David J., 4,427,662, Cl. 424-180.000.

Abbott, Robert C.: *See*—
Anbar, Michael; and Abbott, Robert C., 4,427,884, Cl. 250-283.000.

Abe, Hideo: *See*—
Yuhara, Akitsuna; Iida, Shinya; Abe, Hideo; Kishimoto, Kiyoharu; and Hazama, Katashi, 4,427,515, Cl. 204-192.00E.

Abe, Mitsunobu: *See*—
Oguri, Yasuo; Awata, Mitsuru; Saito, Junji; Inoue, Soichi; Andio, Tatsuo; and Abe, Mitsunobu, 4,427,611, Cl. 264-86.000.

Abe, Nobuo; Sugawara, Hiroyuki; Kurosawa, Yukio; Wada, Akira; and Iwashita, Kiyoji, to Hitachi, Ltd. Vacuum interrupter. 4,427,857, Cl. 200-144.00B.

Abe, Ryozo; Sakurai, Masaki; Sugiyama, Hiroyuki; Yusa, Yasuhiro; and Yoshihara, Kenji, to Victor Company of Japan, Ltd. High-speed search system in a rotary recording medium reproducing apparatus. 4,428,074, Cl. 369-32.000.

Abe, Ryozo: *See*—
Sugiyama, Hiroyuki; Abe, Ryozo; Sakurai, Masaki; and Yoshihara, Kenji, 4,428,003, Cl. 358-342.000.

Abe, Toshiro: *See*—
Kimura, Akira; and Abe, Toshiro, 4,426,972, Cl. 123-378.000.

Abercrombie, Bolling A.: *See*—
Blann, Jack R.; West, Robert C.; and Abercrombie, Bolling A., 4,427,345, Cl. 417-54.000.

Abrahams, Roy: *See*—
Brockas, Anthony; Abrahams, Roy; and Kelly, James D., 4,427,647, Cl. 424-1.100.

Abys, Joseph A., to Bell Telephone Laboratories, Incorporated. Platinum and platinum alloy electroplating baths and processes. 4,427,502, Cl. 204-44.000.

Adachi, Kinichi: *See*—
Kotera, Takuro; Ohmukai, Yoshimi; Kawasaki, Yoshitaka; and Adachi, Kinichi, 4,427,365, Cl. 431-196.000.

Adachi, Rai R., to Erwel Inc. Bi-metallic steam trap. 4,427,149, Cl. 236-59.000.

Adam, Milan: *See*—
Stol, Miroslav; Tolar, Miroslav; Adam, Milan; Cefelin, Pavel; and Kalal, Jaroslav, 4,427,808, Cl. 524-24.000.

Adams, James B., Jr., to Otis Engineering Corporation. Valve. 4,427,175, Cl. 251-58.000.

Adams, Michael P.: *See*—
Lipp, Steven A.; and Adams, Michael P., 4,427,395, Cl. 445-37.000.

Adamson, Hugh P., to University Patents, Inc. Radiometer apparatus for air disturbance detection. 4,427,306, Cl. 374-128.000.

Adeka Argus Chemical Co., Ltd.: *See*—
Aoki, Toshihiro; and Iida, Yoshio, 4,427,816, Cl. 524-357.000.

Adlercreutz, Herman; Suovaniemi, Osmo A.; Partanen, Paul; and Suni, Jucea I., to Labsystems OY. Immunoassay for fecal human hemoglobin. 4,427,769, Cl. 435-7.000.

Adna Aktiengesellschaft: *See*—
Truninger, Thomas, 4,427,170, Cl. 248-51.000.

Advanced Diagnostic Research Corporation: *See*—
Finsterwald, P. Michael; and Kopel, LeRoy, 4,426,886, Cl. 73-633.000.

Advanced Instrument Development, Inc.: *See*—
Chattin, Robert A., 4,427,946, Cl. 328-7.000.

Aerotech, Incorporated: *See*—
Hornok, Emery; and Killian, Gary L., 4,426,763, Cl. 29-568.000.

Agence Nationale de Valorisation de la Recherche (ANVAR): *See*—
Le Francier, Pierre; Audibert, Francoise; Choay, Jean; Chedid, Louis; and Lederer, Edgar, 4,427,659, Cl. 424-177.000.

AGFA-Gevaert Aktiengesellschaft: *See*—
Frenken, Hans; Friedsam, Josef; and Voss, Karl, 4,427,645, Cl. 423-658.500.
Hourticolon, Roland; Roth, Gerhard; Frenken, Hans; Schaffer, Helmut; and Koepke, Gunther, 4,426,757, Cl. 29-121.800.
Lohmann, Joachim W.; Renner, Gunter; and Sauerteig, Wolfgang, 4,427,763, Cl. 430-504.000.

Agrator, S.A.: *See*—
De Aberasturi, Doreoteo J., 4,427,076, Cl. 172-548.000.

Aibe, Toshio; Tsutsumi, Yoshio; and Noguchi, Katsuya, to Takeda Chemical Industries, Ltd. Gas deodorization method. 4,427,630, Cl. 422-4.000.

Aikawa, Masaki: *See*—
Yagi, Norio; Chiba, Hisashi; Mitsuda, Yutaka; Sakano, Yasuaki; and Aikawa, Masaki, 4,427,832, Cl. 525-238.000.

Aizawa, Hitoshi; and Takarada, Masaaki, to Kawasaki Steel Corporation. Automatic control methods and devices for rolling hills. 4,428,054, Cl. 364-472.000.

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Ajinomoto Company Incorporated: *See*—
Tsuchida, Takayasu; Miwa, Kiyoshi; Nakamori, Shigeru; and Momose, Haruo, 4,427,773, Cl. 435-110.000.

Akagiri, Kenzo; Katakura, Masayuki; and Ookouchi, Motomi, to Sony Corporation. Noise reduction circuit. 4,427,950, Cl. 330-149.000.

Akers, John B.; Littler, Jane A.; and Peters, David C., to Lever Brothers Company. Process for the manufacture of soap. 4,427,572, Cl. 252-369.000.

Akimenko, Vladimir B.: *See*—
Petrov, Alexei K.; Akimenko, Vladimir B.; Zhuchin, Vladimir N.; Tsipunov, Alexei G.; Smirnova, Elena N.; Skornyakov, Jury N.; and Klimenko, Alexandr F., 4,427,626, Cl. 419-28.000.

Akimoto, Hidetoshi: *See*—
Arashi, Norio; Hishinuma, Yukio; Akimoto, Hidetoshi; Takahashi, Sadao; Nakajima, Fumito; and Gomi, Kenichi, 4,427,642, Cl. 423-244.000.

Aktiebolaget Carl Munters: *See*—
Korsell, Lars E. R., 4,427,607, Cl. 261-112.000.

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Norlander, Lars G.; Brask, Erik T.; and Moren, Rolf R., 4,427,307, Cl. 384-93.000.

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Comploi, Georg; Heimgartner, Roland; Loacker, Artur; Huber, Kurt; and Wallimann, Hans, 4,426,941, Cl. 112-84.000.
Oesterle, Gerhard; Jaeger, Rudolph; Auer, Willibald; and Unfried, Hermann, 4,427,038, Cl. 139-449.000.

Albany International Corp.: *See*—
Johnson, Cary P., 4,427,734, Cl. 428-234.000.
Rudt, Robert J., 4,426,795, Cl. 34-116.000.

Albert, Cornelia; and Rauterberg, Ulf, to Siemens Aktiengesellschaft. Method for sealing an electrical component, particularly a relay. 4,427,612, Cl. 264-154.000.

Alberts, Heinrich; Fischer, Winfried; and Leuschke, Christian, to Bayer Aktiengesellschaft. Thermoplastic moulding compositions of co-graft polymers. 4,427,809, Cl. 524-37.000.

Albrecht, Peter; Reymann, Wolfgang; and Vogel, Klaus, to Krupp Corpoplast Maschinenbau GmbH. Apparatus for blow molding plastic articles from a parison. 4,427,360, Cl. 425-541.000.

Alcan Aluminum Corporation: *See*—
Gailey, J. Lynn, 4,426,822, Cl. 52-669.000.

Allain, Ronald J.: *See*—
Fong, Dodd W.; and Allain, Ronald J., 4,427,821, Cl. 524-555.000.

Allaire, Roger A.; and Simonson, Edwin J., to Corning Glass Works. Method controlling thermal gradients in glass. 4,427,430, Cl. 65-41.000.

Allen, Robert H., to University Patents, Inc. Method for assaying vitamin-containing compositions for vitamin analogues. 4,427,780, Cl. 436-505.000.

Alley, David W. Mechanical end face seal. 4,427,204, Cl. 277-85.000.

Allgeier, Hans; and Gagneux, Andre, to Ciba-Geigy Corporation. Triazolobenzodiazepine derivatives. 4,427,590, Cl. 260-245.500.

Allied Corporation: *See*—
Becher, James V.; and Spaulding, Tedford H., 4,427,879, Cl. 250-215.000.
Degrassi, Alfieri; Sacks, William; Sibilia, John P.; Kotliar, Abraham M.; and Mason, Charles D., 4,427,825, Cl. 525-56.000.
Mathe, Istvan; and Kasper, Alan H., 4,427,251, Cl. 339-97.00P.
Nash, Donald R., 4,426,974, Cl. 123-418.000.

Allis-Chalmers Corporation: *See*—
Backlin, Robert R., 4,427,202, Cl. 277-68.000.
Belsanti, James F., 4,427,201, Cl. 277-24.000.
Gafford, Alexander T., 4,427,207, Cl. 280-43.230.
Hansen, Kenneth N., 4,426,890, Cl. 74-478.000.

Allison, David K.: *See*—
Marlatt, George R.; and Allison, David K., 4,427,624, Cl. 376-352.000.

Almouli, Albert A. Aerosol dispenser container and actuator therefor. 4,427,134, Cl. 222-153.000.

Alsthom-Atlantique: *See*—
Aumont, Pierre; and Dupraz, Jean-Pierre, 4,427,900, Cl. 307-149.000.

Altman, Leonard C.: *See*—
Schiffman, Elliott; and Altman, Leonard C., 4,427,660, Cl. 424-177.000.

Altobellis, Richard M.: *See*—
Applequist, Roy A.; Altobellis, Richard M.; Bagnell, Glade N.; Hoppe, Robert F.; Jacques, James O.; and Johnson, Terry G., 4,428,012, Cl. 360-106.000.

Amada Engineering & Service Co.: *See*—
Orita, Naoki; and Matsumoto, Toshiyuki, 4,427,873, Cl. 219-121.0LK.

Amada, Nobutaka; Nakagaki, Harushige; and Inoue, Shigeki, to Hitachi, Ltd. Protective device for power amplifier. 4,427,951, Cl. 330-298.000.

Ambac Industries, Inc.: *See*—
Galis, Leon A.; and Czarnik, Richard J., 4,426,970, Cl. 123-364.000.

Ambrose, Richard J.: *See*—
Hergenrother, William L.; Matlock, Mark G.; and Ambrose, Richard J., 4,427,828, Cl. 525-66.000.

American District Telegraph Company: *See*—
Galvin, Aaron A., 4,427,888, Cl. 250-331.000.
Sheahan, Robert F., 4,427,974, Cl. 340-539.000.

American Hoechst Corporation: *See*—
Platzer, Stephan J., 4,427,500, Cl. 204-33.000.

Amersham International Limited: *See*—
Brockas, Anthony; Abrahams, Roy; and Kelly, James D., 4,427,647, Cl. 424-1.100.

Ammermann, Eberhard: *See*—
Rentzea, Costin; Zeeh, Bernd; Ammermann, Eberhard; Hamprecht, Gerhard; and Pommer, Ernst-Heinrich, 4,427,688, Cl. 424-270.000.

AMP Incorporated: *See*—
Bright, Edward J.; and Kandybowski, Steven J., 4,427,249, Cl. 339-17.0CF.
Grabbe, Dimitry G., 4,426,769, Cl. 29-588.000.
Moore, Jerry L.; and Taylor, Attalee S., 4,427,316, Cl. 403-2.000.
Mueller, Arthur L., 4,427,258, Cl. 339-272.00R.
Stillie, Donald G., 4,427,861, Cl. 200-159.00B.
Wagner, Richard M., 4,427,498, Cl. 204-26.000.

Ampex Corporation: *See*—
Fawkes, John S., 4,428,008, Cl. 360-61.000.

Analog Devices, Incorporated: *See*—
Brokaw, Adrian P.; and Maidique, Modesto A., 4,427,973, Cl. 340-347.0AD.

Anantha, Narasipur G.; Bhatia, Harsaran S.; Gaur, Santosh P.; and Walsh, James L., to International Business Machines Corporation. High density memory cell. 4,427,989, Cl. 357-21.000.

Anbar, Michael; and Abbott, Robert C., to Research Foundation of State University of New York, The. Method for detecting and quantifying carbon isotopes. 4,427,884, Cl. 250-283.000.

Anderson, Arthur E.: *See*—
Vaerewyck, Eugene G.; and Anderson, Arthur E., 4,428,017, Cl. 361-31.000.

Anderson, Harry V., to Rosemount Inc. Feedthrough apparatus. 4,427,842, Cl. 174-77.00R.

Anderson, Joseph R., to Werner Lehara, Inc. Dough ball rolling apparatus. 4,427,357, Cl. 425-333.000.

Anderson, Ronald L.: *See*—
Fields, Ellis K.; and Anderson, Ronald L., 4,427,565, Cl. 252-56.00D.

Anderson, Roy E., to General Electric Company. Phase-variable spiral antenna and steerable arrays thereof. 4,427,984, Cl. 343-764.000.

Andersson, Bengt V., to Andersson, Bengt Valfrid. Device for lifting loads, especially heavy loads, in a stepwise manner by means of one or several jacks. 4,427,181, Cl. 254-108.000.

Andersson, Bengt Valfrid: *See*—
Andersson, Bengt V., 4,427,181, Cl. 254-108.000.

Andio, Tatsuo: *See*—
Oguri, Yasuo; Awata, Mitsuru; Saito, Junji; Inoue, Soichi; Andio, Tatsuo; and Abe, Mitsunobu, 4,427,611, Cl. 264-86.000.

Ando, Shizuo: *See*—
Sato, Reisuke; and Ando, Shizuo, 4,428,010, Cl. 360-73.000.

Andrei-Alexandru, Marcel; and Prohaska, Hans, to ITT Industries, Inc. Window and door locking system for vehicles. 4,427,929, Cl. 318-282.000.

Andrews, John L. Ice cream scoop assembly. 4,427,702, Cl. 426-101.000.

Ansay, Norbert J.: *See*—
Klas, Kenneth H.; and Ansay, Norbert J., 4,426,831, Cl. 56-295.000.

Anstey, Henry D.: *See*—
Soteropulos, Gust S.; and Anstey, Henry D., 4,426,926, Cl. 100-88.000.

Anumin Pty. Ltd.: *See*—
Parker, Alan J.; and Muir, David M., 4,427,571, Cl. 252-364.000.

Anzai, Masayasu: *See*—
Tokunaga, Kazuyoshi; and Anzai, Masayasu, 4,427,755, Cl. 430-97.000.

Aoki, Kozo; and Seoka, Yoshio, to Fuji Photo Film Co., Ltd. Color photographic sensitive materials. 4,427,767, Cl. 430-552.000.

Aoki, Toshihiro; and Iida, Yoshio, to Adeka Argus Chemical Co., Ltd. β-Diketone and hydrotalcite stabilizer compositions for halogen-containing polymers and polymer compositions containing the same. 4,427,816, Cl. 524-357.000.

Aoyama, Hirokazu: *See*—
Fukui, Shoshin; Shinjo, Masayoshi; and Aoyama, Hirokazu, 4,427,803, Cl. 523-402.000.

Applequist, Roy A.; Altobellis, Richard M.; Bagnell, Glade N.; Hoppe, Robert F.; Jacques, James O.; and Johnson, Terry G., to MiniScribe Corporation. Method and apparatus for storing and retrieving information. 4,428,012, Cl. 360-106.000.

Applied Magnetics Corporation: *See*—
Martin, Richard T., 4,427,711, Cl. 427-10.000.

Arai, Atsuaki: *See*—
Kitatani, Katuji; Sera, Hidefumi; Arai, Atsuaki; Ogawa, Masasi; Ishigaki, Kunio; and Ogura, Haruo, 4,427,768, Cl. 430-623.000.

Arai, Hiroshi: *See*—
Hirose, Hisashi; Arai, Hiroshi; Iiyama, Hiroshi; and Komiya, Hirokazu, 4,426,788, Cl. 33-395.000.

Arakawa, Hiroshi: *See*—
Yoshida, Kazunori; and Arakawa, Hiroshi, 4,427,036, Cl. 139-435.000.

Araki, Kenji; Kurata, Masashi; Yamana, Hideo; Suda, Toyoharu; Tayama, Katuhiko; and Watanabe, Masaji, to Nippon Kokan Kabushiki Kaisha; and Nippon Mining Co., Ltd. Method of making material for shadow masks. 4,427,460, Cl. 148-12.00C.

Arakida, Yutaka: *See*—
Miura, Tsuyoshi; Arakida, Yutaka; Kondo, Yoshikazu; and Ide, Tsuneyuki, 4,427,446, Cl. 75-244.000.

Arashi, Norio; Hishinuma, Yukio; Akimoto, Hidetoshi; Takahashi, Sadao; Nakajima, Fumito; and Gomi, Kenichi, to Babcock-Hitachi Kabushiki Kaisha. Process for dry desulfurization of flue gas. 4,427,642, Cl. 423-244.000.

Arco Industries Ltd.: *See*—
D'Andrade, Bruce M., 4,427,389, Cl. 434-110.000.

Arguilez, Arcadio C. Dual fuel filter system. 4,427,545, Cl. 210-333.100.

Argyle Management Company: *See*—
Pochter, Keith A., 4,426,812, Cl. 52-22.000.

Ariniello, Robert M.; and Bray, Stuart W., to Storage Technology Corporation. Combined rewind foot/tape cleaner. 4,426,750, Cl. 15-308.000.

Arman S.p.A.: *See*—
Maiocco, Guiseppe, 4,427,967, Cl. 340-52.00D.

Armco Inc.: *See*—
Lawson, John E., 4,427,072, Cl. 166-345.000.

Armstrong World Industries, Inc.: *See*—
Corrigan, James L.; Howett, Deborah L.; and Schouten, Gerard M., 4,427,118, Cl. 211-45.000.

Aron, Mitchell; and Rover, Jr., Ralph R., to Bendix Corporation, The. Color separator for a video display generator. 4,427,994, Cl. 358-54.000.

Arrow Paper Products Co.: *See*—
Stark, Martin H.; Pisani, George V.; and Pauquette, James J., 4,427,724, Cl. 428-7.000.

Asada, Haruhiko: *See*—
Kanade, Takeo; and Asada, Haruhiko, 4,427,880, Cl. 250-222.100.

Asahi Glass Company Ltd.: *See*—
Oda, Yoshio; Morimoto, Takeshi; and Suzuki, Kohji, 4,427,523, Cl. 204-290.00R.

Asahi Kasei Kogyo Kabushiki Kaisha: *See*—
Iwashita, Hidemaro; Mieno, Fumiaki; Kiura, Yoshinori; and Hayashi, Kenichi, 4,427,637, Cl. 422-198.000.

Asahi Kogaku Kogyo Kabushiki Kaisha: *See*—
Haraguchi, Keisuke, 4,427,277, Cl. 354-402.000.

Ashimori Industry Co., Ltd.: *See*—
Kamuro, Takashi; Ohtsuga, Hisao; Kimura, Hiroshi; and Nakamura, Takeshi, 4,427,480, Cl. 156-287.000.

Ashland Oil, Inc.: *See*—
Busch, Lloyd E.; and Henderson, Gerald O., 4,427,539, Cl. 208-127.000.

Atlantic Richfield Company: *See*—
Hutchison, David A., 4,427,563, Cl. 252-52.00R.
Lichtin, Norman N., 4,427,508, Cl. 204-157.10R.
Lichtin, Norman N., 4,427,509, Cl. 204-157.10R.
Lichtin, Norman N.; and Vijayakumar, Kalambella M., 4,427,510, Cl. 204-157.10R.
Meyer, Clifford J., 4,427,185, Cl. 266-220.000.
Otto, Dennis L., 4,427,242, Cl. 308-187.200.
Plys, Albert G.; Dresser, Thorpe; Ohlswager, Stanley; and Peterman, Lee G., 4,427,305, Cl. 374-45.000.

Atomel Corporation: *See*—
Bowers, Gerald M., 4,427,378, Cl. 432-242.000.

Atsumi, Haruo; and Koizumi, Haruyuki, to Omron Tateisi Electronics Co. Mechanical snap switch having a mechanism for separating fused contacts. 4,427,856, Cl. 200-76.000.

Aubard, Gilbert G.: *See*—
Torossian, Dieran R.; Aubard, Gilbert G.; Roux, Claude P.; and Grouhel, Agnes G., 4,427,671, Cl. 424-243.000.

Aucktor, Erich, to Lohr & Bromkamp GmbH. Wheel support assembly for a motor vehicle. 4,427,085, Cl. 180-70.00R.

Audi NSU Auto Union AG: *See*—
Weichenrieder, Albert; Krammel, Horst; and Rion, Claude, 4,427,215, Cl. 280-752.000.

Audi NSU Auto Union Aktiengesellschaft: *See*—
van Basshuysen, Richard; Schmidt, Dietrich; and Ruf, Max, 4,427,150, Cl. 237-2.00A.

Audibert, Francoise: *See*—
Le Francier, Pierre; Audibert, Francoise; Choay, Jean; Chedid, Louis; and Lederer, Edgar, 4,427,659, Cl. 424-177.000.

Auer, Willibald: *See*—
Oesterle, Gerhard; Jaeger, Rudolph; Auer, Willibald; and Unfried, Hermann, 4,427,038, Cl. 139-449.000.

Augat Inc.: *See*—
Petersen, Richard W., 4,427,247, Cl. 339-14.00R.

Augustin, Ulrich, to Daimler-Benz A.G. Fuel injection pump for internal combustion engines. 4,427,347, Cl. 417-296.000.

Aumont, Pierre; and Dupraz, Jean-Pierre, to Alsthom-Atlantique. Supply circuit for electronic apparatus at a high electric potential. 4,427,900, Cl. 307-149.000.

Ausonics Pty. Ltd.: *See*—
Bui, Tuan S.; and Sherlock, John A., 4,427,912, Cl. 310-322.000.

Austin, Paul R., to University of Delaware. Wound healing compositions and formulations. 4,427,654, Cl. 424-95.000.

Automation Industries, Inc.: *See*—
Kutnyak, Thomas A.; and Johnson, Donald L., 4,427,485, Cl. 156-429.000.

Avalon Industries, Inc.: *See*—
Berman, Morton, 4,427,391, Cl. 434-408.000.

Avco Corporation: *See*—
Christie, Walter E., 4,426,778, Cl. 30-90.100.
Klass, Larry S., 4,426,866, Cl. 72-53.000.

Avery-Hardoll Limited: *See*—
Thomson, John A., 4,427,132, Cl. 222-23.000.

Avny, Sam. Stake system for flatbed vehicles. 4,427,230, Cl. 296-43.000.

Awata, Mitsuru: *See*—
Oguri, Yasuo; Awata, Mitsuru; Saito, Junji; Inoue, Soichi; Andio, Tatsuo; and Abe, Mitsunobu, 4,427,611, Cl. 264-86.000.

Ayer, Donald E.; and Schlagel, Carl A., to Upjohn Company, The. Reduced A ring-$\Delta^{9(11)}$-corticoids. 4,427,591, Cl. 260-397.450.

Ayer, Raghavan: *See*—
Ramanarayahan, Trikur A.; Petkovic-Luton, Ruzica; and Ayer, Raghavan, 4,427,447, Cl. 75-252.000.

Ayres, Barry; O'Callaghan, Cynthia; Livermore, David G. H.; and Newall, Christopher E., to Glaxo Group Limited. Cephalosporin antibiotics. 4,427,675, Cl. 424-246.000.

B. D. Wait Company Limited: *See*—
Shepherd, Charles G., 4,426,990, Cl. 126-9.00B.

B/K Patent Development Company, Inc.: *See*—
Schwab, Pierre P., 4,427,851, Cl. 200-16.00D.

Baba, Fumio, to Fujitsu Limited. IC with built-in electrical quality control flag. 4,428,068, Cl. 365-200.000.

Babcock-Hitachi Kabushiki Kaisha: *See*—
Arashi, Norio; Hishinuma, Yukio; Akimoto, Hidetoshi; Takahashi, Sadao; Nakajima, Fumito; and Gomi, Kenichi, 4,427,642, Cl. 423-244.000.

Bacino, David J.: *See*—
Tadanier, John S.; Hallas, Robert; Freiberg, Leslie A.; and Bacino, David J., 4,427,662, Cl. 424-180.000.

Backhouse, Alan J.; Thorne, Stephen J.; and Hunt, Patrick A., to Imperial Chemical Industries PLC. Production of polymer microparticles and coating compositions containing them. 4,427,820, Cl. 524-504.000.

Backlin, Robert R., to Allis-Chalmers Corporation. Combination static oil seal and rotary dust seal. 4,427,202, Cl. 277-68.000.

Badge A. Minit Ltd.: *See*—
Kufrin, Fred, 4,426,781, Cl. 30-310.000.

Badische Corporation: *See*—
Orton, Denis G., 4,427,414, Cl. 8-480.000.

Baeger, Holm: *See*—
Faust, Wolfgang; Nickol, Friedrich W.; and Baeger, Holm, 4,426,775, Cl. 29-846.000.

Bagnell, Glade N.: *See*—
Applequist, Roy A.; Altobellis, Richard M.; Bagnell, Glade N.; Hoppe, Robert F.; Jacques, James O.; and Johnson, Terry G., 4,428,012, Cl. 360-106.000.

Bahnsen, Heiner; and Hosten, Daniel, to Siemens Aktiengesellschaft. Device for electroplating a portion of a moving workpiece. 4,427,520, Cl. 204-224.00R.

Bailey, David F.: *See*—
Fennell, Robert D.; Weidler, Allen J.; and Bailey, David F., 4,427,980, Cl. 340-825.520.

Bailey, Wayne. Hydraulic power plant. 4,426,846, Cl. 60-398.000.

Baisden, Jerry. Attachment for a backhoe arm. 4,426,782, Cl. 30-379.500.

Baker International Corporation: *See*—
Bowyer, Michael L., 4,427,064, Cl. 166-217.000.

Baker Oil Tools, Inc.: *See*—
Carmody, Michael A., 4,427,071, Cl. 166-332.000.

Balbis, Manuel G.; and King, Colin V., to Firestone Tire & Rubber Company, The. Advanced profile radial tire having relatively high inflation pressure. 4,427,046, Cl. 152-209.00R.

BALCAR: *See*—
Baliozian, Mardick, 4,428,029, Cl. 362-12.000.

Baliozian, Mardick, to BALCAR. Light gathering device for transmitting light from a flash to an optical fiber bundle for photographing small objects, and device incorporating same. 4,428,029, Cl. 362-12.000.

Baliozian, Mardick, to Tekno AG. Modular light-diffusing or reflecting plastic panel. 4,428,030, Cl. 362-18.000.

Ballato, Arthur: *See*—
Isfrate, Gerald J.; and Ballato, Arthur, 4,427,913, Cl. 310-334.000.

Bally Manufacturing Corporation: *See*—
Hooker, Donald E.; and Tojza, Roman A., 4,427,196, Cl. 273-143.00R.

Baloga, Michael R., to Du Pont de Nemours, E. I., and Company. Preparation concentrated TiO_2slurries from spent steam. 4,427,451, Cl. 106-300.000.

Banno, Mitsuyuki: *See*—
Suzuki, Shosuke; Ito, Teruyoshi; Sakakibara, Yukio; Yamada, Takashi; Kubo, Fumiyoshi; Yoshimura, Kunimasa; Ugajin, Mitsuyuki; Kaji, Kiyokane; and Banno, Mitsuyuki, 4,426,975, Cl. 123-425.000.

Banucci, Eugene G.; and Olander, Walter K., to General Electric Company. Oxidative coupling of phenolic monomers with manganese complexes of phenyl benzoin oxime catalysts. 4,427,594, Cl. 260-429.00C.

Barber-Colman Company: *See*—
Fransson, George E.; Johnson, Stuart J.; and Haug, Edward W., 4,427,324, Cl. 409-12.000.

Barber, Monte D.: *See*—
Johnson, Ronald G.; and Barber, Monte D., 4,427,426, Cl. 55-162.000.

Barham, Peter J.; and Holmes, Paul A., to Imperial Chemical Industries PLC. 3-Hydroxybutyric acid polymers. 4,427,614, Cl. 264-210.100.

Barnes, David I.: *See*—
Robinson, Joseph G.; Barnes, David I.; and Carswell, Angela M., 4,427,578, Cl. 502-177.000.

Barnett, Eugene R.: *See*—
Dean, James C.; and Barnett, Eugene R., 4,426,816, Cl. 52-202.000.

Barney, John H., to Tosco Corporation. Apparatus for practicing heat flux control technique. 4,427,493, Cl. 202-100.000.

Barnhart, Ronald W.: *See*—
Wehmeyer, Donald T.; and Barnhart, Ronald W., 4,427,093, Cl. 182-141.000.

Baron, Kenneth S.; and Wood, David W., to Hexcel Corporation. Cold water curable orthopedic cast. 4,427,002, Cl. 128-83.000.

Barron, Ellis. Pianoharp action. 4,426,905, Cl. 84-258.000.

Barth, Wayne E., to Pfizer Inc. 6-Aminomethylpenicillanic acid 1,1-dioxide derivatives as beta-lactamase inhibitors. 4,427,678, Cl. 424-246.000.

Bartholic, David B., to Engelhard Corporation. Selective vaporization process and apparatus. 4,427,538, Cl. 208-127.000.

BASF Aktiengesellschaft: *See*—
Echte, Adolf; Gausepohl, Hermann; Hofmann, Hermann P.; and Mittnacht, Hans, 4,427,826, Cl. 525-53.000.
Hoffmann, Benno, 4,426,818, Cl. 52-309.400.
Kempter, Fritz E.; and Schupp, Eberhard, 4,427,514, Cl. 204-181.00C.
Rentzea, Costin; Zeeh, Bernd; Ammermann, Eberhard; Hamprecht, Gerhard; and Pommer, Ernst-Heinrich, 4,427,688, Cl. 424-270.000.
Tonne, Peter; Mueller, Elisabeth R.; and Goerth, Helmut, 4,427,600, Cl. 260-505.00E.
von der Osten, Eckhart; Stewart, James F.; and Bennett, John M., 4,427,440, Cl. 71-94.000.

Battelle Memorial Institute: *See*—
Harmer, Alan L., 4,427,293, Cl. 356-133.000.

Bauer, Wilhelm; Haberle, Fritz; and Riechers, Daniel, to Daimler-Benz Aktiengesellschaft. Bumper for motor vehicles. 4,427,225, Cl. 293-132.000.

Bauerle, Rolf, to Ciba-Geigy A.G. Dye mixture, and its use in transfer printing. 4,427,413, Cl. 8-471.000.

Bausch & Lomb Incorporated: *See*—
Fogg, C. Davis, 4,427,271, Cl. 351-154.000.

Baxter Travenol Laboratories, Inc.: *See*—
Pauly, John A.; and Malinoski, John K., 4,427,866, Cl. 219-10.55B.

Bayer Aktiengesellschaft: *See*—
Alberts, Heinrich; Fischer, Winfried; and Leuschke, Christian, 4,427,809, Cl. 524-37.000.
Bruck, Dieter W.; Jeblick, Werner; Konigshofen, Heinrich; Roos, Ernst; and Ruetz, Lother, 4,427,817, Cl. 524-367.000.
Hammerschmidt, Erich; Behre, Horst; Blank, Heinz U.; and Lindner, Otto, 4,427,601, Cl. 260-509.000.
Konig, Klaus; Becker, Gernot; and Seifert, Peter, 4,427,798, Cl. 521-173.000.
Kraatz, Udo; Stetter, Jorg; Buchel, Karl H.; Frohberger, Paul-Ernst; and Brandes, Wilhelm, 4,427,672, Cl. 424-245.000.
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BBC Brown, Boveri and Company, Limited: *See*—
Cancio, Modesto-Manuel, 4,427,859, Cl. 200-148.00B.
Fehr, Werner; Ohlin, Claes; and Schabrun, Bruno, 4,427,858, Cl. 200-146.00R.
Maier, Franz, 4,428,023, Cl. 361-100.000.
Stucki, Samuel, 4,427,504, Cl. 204-101.000.

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Becher, James V.; and Spaulding, Tedford H., to Allied Corporation. Optoelectronic connector assembly. 4,427,879, Cl. 250-215.000.

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Nielsen, Steven T., 4,427,406, Cl. 494-16.000.
Peacock, Jon R.; and Schmidt, Robert L., 4,427,633, Cl. 422-83.000.
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Buckle, Derek R.; and Smith, Harry, 4,427,686, Cl. 424-269.000.
Cole, Martin; Howarth, Thomas T.; and Reading, Christopher, 4,427,690, Cl. 424-272.000.
Zomaya, Iskander I.; and Davies, John S., 4,427,689, Cl. 424-272.000.

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Stemp, Geoffrey, 4,427,685, Cl. 424-267.000.

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Hammerschmidt, Erich; Behre, Horst; Blank, Heinz U.; and Lindner, Otto, 4,427,601, Cl. 260-509.000.

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BEI Electronics, Inc.: *See—*
Haville, George D.; and Johnson, Paul A., 4,427,972, Cl. 340-347.00P.

Beiersdorf Aktiengesellschaft: *See—*
Prahl, Jan, 4,426,742, Cl. 3-36.000.

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Belanger, James A.; Wentworth, Robert J.; Calvin, Douglas J.; and Lapham, James M., 4,427,049, Cl. 160-199.000.

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Sprecker, Mark A.; Klemarczyk, Philip T.; and Belko, Robert P., 4,427,708, Cl. 426-538.000.

Bell, Frank H., to Thiokol Corporation. Contact fuze for mine munitions. 4,426,932, Cl. 102-221.000.

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Bell Helicopter Textron Inc.: *See—*
Metzger, Robert W.; Neathery, William D.; Reyes, Peter A.; Tisdale, Patrick R.; Covington, Cecil E.; and Broekhuizen, Willem, 4,427,340, Cl. 416-141.000.

Bell Telephone Laboratories, Incorporated: *See—*
Abys, Joseph A., 4,427,502, Cl. 204-44.000.
Dutt, Bulusu V., 4,427,464, Cl. 148-171.000.
Levinstein, Hyman J.; and Vratny, Frederick, 4,427,516, Cl. 204-192.00E.
Liron, Moshe, 4,428,044, Cl. 364-200.000.

Belmonte, James A.; and Hillman, Arthur E., to Corning Glass Works. Masking apparatus for selectively charging honeycomb structures. 4,427,723, Cl. 428-117.000.

Beloit Corporation: *See—*
Cronin, Dennis C., 4,427,492, Cl. 162-358.000.

Belsanti, James F., to Allis-Chalmers Corporation. Double seal having vibration damping and lubricating means. 4,427,201, Cl. 277-24.000.

Benander, Robert E.: *See—*
Holzl, Robert A.; Benander, Robert E.; and Davis, Robert D., 4,427,445, Cl. 75-234.000.

Bendix Corporation, The: *See—*
Aron, Mitchell; and Rover, Jr., Ralph R., 4,427,994, Cl. 358-54.000.
Kyriakos, Constantinos S., 4,427,981, Cl. 343-12.00A.
Michaels, Paul A., 4,428,062, Cl. 364-821.000.
Sisson, Albert E.; and Lewis, Donald J., 4,427,152, Cl. 239-90.000.
Taplin, Lael B.; Walter, Richard P.; Kelso, Charles R.; and Sisson, Albert E., 4,426,977, Cl. 123-446.000.
Whiteside, Arliss E.; and Wolber, William G., 4,427,971, Cl. 340-347.0DA.

Benecke, Herman P.; and Sherwood, Bob E., to Vinoxen Company, Inc., The. Sesamin as a psychotropic agent. 4,427,694, Cl. 424-282.000.

Benefiel, Earl H.: *See—*
Matthewson, Randall W.; Benefiel, Earl H.; and Brudi, Ronald A., 4,427,117, Cl. 211-13.000.

Bennett, John E.; and Harney, David E., to Diamond Shamrock Corporation. Bronze suppression in an alkali metal/sulfur ammonia battery. 4,427,747, Cl. 429-50.000.

Bennett, John M.: *See—*
von der Osten, Eckhart; Stewart, James F.; and Bennett, John M., 4,427,440, Cl. 71-94.000.

Benning, Jack G., Jr.: *See—*
Maltby, Frederick L.; Loewenstern, Kenneth M.; and Benning, Jack G., Jr., 4,428,026, Cl. 361-280.000.

Bentley Engineering Co., Ltd., The: *See—*
Wells, Anthony J.; Smith, William C.; and Seekings, Gerald A. G., 4,426,855, Cl. 66-125.00R.

Benz, Claude L., to Colgate-Palmolive Company. Method for reconditioning of poorly flowing or caked detergent powders. 4,427,567, Cl. 252-116.000.

Bercaw, Raymond: *See—*
Drushel, Robert W.; and Bercaw, Raymond. 4,427,871, Cl. 219-69.00P.

Bergen, Gary R., to Emhart Industries, Inc. Latch bolt assembly with selectively adjustable spindle backset. 4,427,224, Cl. 292-169.230.

Bergkvist, Jorgen, to Stal-Laval Turbin AB. Fluidizable bed combustion chamber. 4,427,364, Cl. 431-170.000.

Bergmann, Heinz. Apparatus for compacting trash in open containers. 4,426,925, Cl. 100-65.000.

Beringer, Richard D.: *See—*
Mola, Clark M.; Evans, Maurice L.; and Beringer, Richard D., 4,426,747, Cl. 15-21.00D.

Berlin, Edwin P., Jr., to Grumman Aerospace Corporation. Multiprocessor with staggered processing. 4,428,048, Cl. 364-200.000.

Berman, Max; Klimmek, William G.; and Konrad, Charles E., to General Electric Company. Electric vehicle current regulator. 4,427,930, Cl. 318-301.000.

Berman, Morton, to Avalon Industries, Inc. Convertible drawing article of furniture. 4,427,391, Cl. 434-408.000.

Berthold, Fritz. Method for quench correction in liquid scintillation counters. 4,427,887, Cl. 250-328.000.

Best, Willie H. High turbulance heat transfer oven. 4,426,792, Cl. 34-28.000.

Betensky, Ellis I.; and Hildebrandt, William J., to Stanley Works, The. Optical sensing system for extensible tape rules. 4,427,883, Cl. 250-237.00G.

Bette, James R.: *See—*
Bette, Joseph A.; Bette, William A.; and Bette, James R., 4,426,997, Cl. 126-445.000.

Bette, Joseph A.; Bette, William A.; and Bette, James R. Solar energy panel. 4,426,997, Cl. 126-445.000.

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Snyder, William R.; and Feuerstein, Diane, 4,427,568, Cl. 252-180.000.

Beveridge, Robert W.: *See—*
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Bhatia, Harsaran S.: *See—*
Anantha, Narasipur G.; Bhatia, Harsaran S.; Gaur, Santosh P.; and Walsh, James L., 4,427,989, Cl. 357-21.000.

Bhatti, Mohinder S.; and Marzocchi, Alfred, to Owens-Corning Fiberglas Corporation. Feeder for forming glass fibers and method for making feeder. 4,427,428, Cl. 65-1.000.

Bhula, Dilipkumar N., to Shell Oil Company. Arctic offshore platform. 4,427,320, Cl. 405-211.000.

Bianchi, Nereo, to Necchi Societa per Azioni. Sewing machine having a supplemental work supporting surface. 4,426,944, Cl. 112-260.000.

Bianchi, Valerio: *See—*
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Bilodeau, Jacques; and Marier, Gaston. Self energizing power pack. 4,427,750, Cl. 429-149.000.

BioChem Technology, Inc.: *See—*
Zabriskie, Dane W., 4,427,778, Cl. 435-277.000.

Biorex Laboratories Limited: *See—*
Chan, Rosalind P. K., 4,427,697, Cl. 424-311.000.

Birkle, Siegfried; Stoger, Klaus; Gehring, Johann; and de Vries, Hans, to Siemens Aktiengesellschaft. Electrically insulating protective device. 4,427,522, Cl. 204-279.000.

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de Vries, Hans; Birkle, Siegfried; Stoeger, Klaus; and Gehring, Johann, 4,427,518, Cl. 204-201.000.

Bittner, Timothy, to Ioptex Inc. Intraocular lens with rotatable appendage. 4,426,741, Cl. 3-13.000.

Black, James F.; Grudkowski, Thomas W.; and DeMaria, Anthony J., to United Technologies Corporation. Ultra-thin microelectronic pressure sensors. 4,426,768, Cl. 29-583.000.

Blaha, Erich: *See—*
Lang, Walter; Blaha, Erich; Schmauder, Roland; and Muchel, Franz, 4,427,269, Cl. 350-500.000.

Blake, Charles A.; and Rodriguez-Sierra, Jorge F., to University of Nebraska, The Board of Regents of the. Contraceptive. 4,427,669, Cl. 424-238.000.

Blake, James E. T., to Garrett Corporation, The. Turbocharger shaft bearing. 4,427,309, Cl. 384-286.000.

Blakemore, John S.: *See—*
Carlson, F. Paul; Blakemore, John S.; and Eror, Nicholas G., 4,427,457, Cl. 148-1.500.

Blanchard, Raymond A., Jr., to SCM Corporation. Power supply sensing circuitry. 4,428,020, Cl. 361-90.000.

Blank, Heinz U.: *See—*
Hammerschmidt, Erich; Behre, Horst; Blank, Heinz U.; and Lindner, Otto, 4,427,601, Cl. 260-509.000.

Blankenship, Robert M.: *See—*
Kowalski, Alexander; Vogel, Martin; and Blankenship, Robert M., 4,427,836, Cl. 525-301.000.

Blann, Jack R.; West, Robert C.; and Abercrombie, Bolling A., to Hughes Tool Company. Artificial lifting device and method. 4,427,345, Cl. 417-54.000.
Blendax-Werke R. Schneider GmbH & Co.: *See*—
Orlowski, Jan A.; and Butler, David V., 4,427,799, Cl. 523-116.000.
Block, Seymour S.: *See*—
LeGrand, Ferdinand; and Block, Seymour S., 4,427,584, Cl. 260-124.00R.
Blum, Arnold, to International Business Machines Corporation. Shift register latch circuit means for check and test purposes and contained in LSI circuitry conforming to level sensitive scan design (LSSD) rules and techniques. 4,428,060, Cl. 364-715.000.
Boart International Limited: *See*—
Tower, Timothy M., 4,427,062, Cl. 166-113.000.
Bodmer, Albert: *See*—
Rakitsch, Peter; and Bodmer, Albert, 4,428,038, Cl. 362-263.000.
Boeckh, Franz-Xaver: *See*—
Hoffmeister, Jurgen; and Boeckh, Franz-Xaver, 4,427,382, Cl. 433-79.000.
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Brown, Stephen T., 4,427,169, Cl. 244-219.000.
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Brasfield, Robert G., 4,428,016, Cl. 361-18.000.
Brooks, George W.; Hart, John W.; and Pettersen, Egil R., 4,426,845, Cl. 60-347.000.
Carter, Charles R., 4,426,909, Cl. 89-1.816.
Kuo, Chyi J., 4,428,078, Cl. 455-3.000.
McKinney, Maurice E.; and Rudolph, Peter K. C., 4,427,168, Cl. 244-214.000.
Robinson, Curtiss W.; and Raymond, Eugene T., 4,426,911, Cl. 91-35.000.
Bomhard, Helmut, to Dyckerhoff & Widmann Aktiengesellschaft. Double-walled tank for low-temperature liquids. 4,426,817, Cl. 52-262.000.
Bonacorsi, Robert W., to Proctor-Silex, Inc. Gravity switch. 4,427,876, Cl. 219-413.000.
Bonaventura, Celia: *See*—
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Bonaventura, Joseph; and Bonaventura, Celia, to Duke University. Processes for extracting oxygen from fluids using immobilized hemoglobin. 4,427,416, Cl. 23-293.00R.
Borg-Warner Corporation: *See*—
Lamarche, Paul E., 4,427,400, Cl. 464-64.000.
Borgarello, Enrico: *See*—
Graetzel, Michael; Kalyanasundaram, Kuppuswamy; Duonghong, Dung; Neumann-Spallart, Michael; and Borgarello, Enrico, 4,427,749, Cl. 429-111.000.
Borgstedt, Hans U., to Kernforschungszentrum Karlsruhe GmbH. Coal hydrogenation in a liquid metallic medium. 4,427,527, Cl. 208-8.00R.
Bosse, Thomas W., to Pitney Bowes Inc. Electrophotocopier line scanning illuminator. 4,427,286, Cl. 355-3.00R.
Bott, John A. Article carrier for automotive vehicles. 4,427,141, Cl. 224-326.000.
Bourns, Inc.: *See*—
Gratzinger, Paul G.; and Kucharski, Lawrence, Jr., 4,427,966, Cl. 338-162.000.
Bouthors, Pierre; and Lecomte, Jacques, to Regie Nationale des Usines Renault. Electromagnetically actuated ball-type injector. 4,427,156, Cl. 239-488.000.
Bouvot, Jean-Francois, to Valeo. Device for the control of the liquid supply of a heat exchanger. 4,427,057, Cl. 165-103.000.
Bowcott, John E. L.: *See*—
England, Richard; Bowcott, John E. L.; Olds, John S.; and Jobling, Alan, 4,427,583, Cl. 260-123.700.
Bowden, Edgar A., to Mobil Oil Corporation. Constant current source. 4,427,935, Cl. 323-280.000.
Bowerman, P. David; and Lucid, Michael F., to Kerr-McGee Chemical Corporation. Sequential process for extraction and recovery of vanadium and uranium from wet process acids. 4,427,640, Cl. 423-10.000.
Bowers, Gerald M., to Atomel Corporation. Closure and seal construction for high-pressure oxidation furnace and the like. 4,427,378, Cl. 432-242.000.
Bowyer, Michael L., to Baker International Corporation. Wire line no-blow tool. 4,427,064, Cl. 166-217.000.
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Brickl, Rolf; Gruber, Peter; Schepky, Gottfried; and Bozler, Gerhard, 4,427,648, Cl. 424-16.000.
Bradburn, Marvin D.: *See*—
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Braid, Milton: *See*—
Horodysky, Andrew G.; and Braid, Milton, 4,427,562, Cl. 252-51.50A.
Brain, David M.; and Frankpitt, Gerald M., to Twose of Tiverton Limited. Implements for injecting substances below the surface of the soil. 4,426,940, Cl. 111-7.000.
Brandes, Wilhelm: *See*—
Kraatz, Udo; Stetter, Jorg; Buchel, Karl H.; Frohberger, Paul-Ernst; and Brandes, Wilhelm, 4,427,672, Cl. 424-245.000.
Kramer, Wolfgang; Buchel, Karl H.; Brandes, Wilhelm; and Frohberger, Paul-Ernst, 4,427,673, Cl. 424-245.000.
Brandt, Susan M.: *See*—
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Brasfield, Robert G., to Boeing Company, The. Overload protected switching regulator. 4,428,016, Cl. 361-18.000.
Brask, Erik T.: *See*—
Norlander, Lars G.; Brask, Erik T.; and Moren, Rolf R., 4,427,307, Cl. 384-93.000.
Brass, Jack: *See*—
Duran, Reginald F.; and Brass, Jack, 4,427,379, Cl. 432-261.000.
Bray, Stuart W.: *See*—
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Brdr. Eskesen Aktieselskab: *See*—
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Bremer, Noel J.: *See*—
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Brickl, Rolf; Gruber, Peter; Schepky, Gottfried; and Bozler, Gerhard, to Dr. Karl Thomae GmbH. Dipyridamole-containing pharmaceutical form. 4,427,648, Cl. 424-16.000.
Brien, Rondald: *See*—
Willgoose, Kenneth; Brien, Rondald; Rose, Peter E.; and Hannah, Clifford G., 4,427,742, Cl. 428-338.000.
Brieuc, Robert, to Kley-France. Linear hydraulic winch comprising a pair of self-clamping jaws clamping alternately the axial cable. 4,427,180, Cl. 254-106.000.
Briggs, Peter J.; and Carpenter, Steven, to Matburn (Holdings) Limited. Surgical drainage bags. 4,427,425, Cl. 55-159.000.
Bright, Edward J.; and Kandybowski, Steven J., to AMP Incorporated. Low height ADS connector. 4,427,249, Cl. 339-17.0CF.
Briner, Emil; Novak, Peter; and Gasser, Hermann, to Rieter Machine Works Limited. Spinning preparatory machine. 4,426,836, Cl. 57-267.000.
Bristol-Myers Company: *See*—
Kaneko, Takushi; and Wong, Henry S. L., 4,427,587, Cl. 260-239.30T.
Kaneko, Takushi; and Wong, Henry S. L., 4,427,588, Cl. 260-239.30T.
British Gas Corporation: *See*—
Hammond, Paul S., 4,427,363, Cl. 431-66.000.
Middleton, Andrew H., 4,427,310, Cl. 384-415.000.
Brockas, Anthony; Abrahams, Roy; and Kelly, James D., to Amersham International Limited. Method and reagent for making a radiopharmaceutical composition based on pertechmetate. 4,427,647, Cl. 424-1.100.
Brockway Engineering Limited: *See*—
Wooldridge, Lawson C., 4,427,106, Cl. 198-842.000.
Broekhuizen, Willem: *See*—
Metzger, Robert W.; Neathery, William D.; Reyes, Peter A.; Tisdale, Patrick R.; Covington, Cecil E.; and Broekhuizen, Willem, 4,427,340, Cl. 416-141.000.
Brokaw, Adrian P.; and Maidique, Modesto A., to Analog Devices, Incorporated. A-To-D converter of the successive-approximation type. 4,427,973, Cl. 340-347.0AD.
Bronkhorst High-Tech BV: *See*—
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Brooks, George W.; Hart, John W.; and Pettersen, Egil R., to Boeing Company, The. Noise reduction in pneumatically drive hydraulic pump. 4,426,845, Cl. 60-347.000.
Brooks, William R.; and Heinzel, Irving C. Mechanical delivery system for a catalyst or the like. 4,427,039, Cl. 141-20.000.
Broussoux, Dominique; Facoetti, Hugues; and Micheron, Francois, to Thomson-CSF. Process for producing piezoelectric polymer films. 4,427,609, Cl. 264-22.000.
Brower, Boyd G., to GTE Products Corporation. Subminiature array with retaining reflector. 4,427,368, Cl. 431-359.000.
Brower, Boyd G., to GTE Products Corporation. Switch paste with silver-coated metal beads. 4,427,369, Cl. 431-359.000.
Brown, Herman O. Flexible sign with improved corner bracket. 4,426,800, Cl. 40-606.000.
Brown, Keith E.; and Buth, Jimmy D., to Kinetico, Inc. Deionization method and apparatus. 4,427,549, Cl. 210-662.000.
Brown, Michael J., to GAF Corporation. Composition for plant growth regulation. 4,427,439, Cl. 11-94.000.
Brown, Michael M.: *See*—
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Brown, Robert L.; and Tufts, Wesley M., to Control Fluidics, Inc. Filter system. 4,427,555, Cl. 210-805.000.
Brown, Ronald L.: *See*—
Wolniak, Stanley C.; Kincaid, Herbert; Spencer, Elbert M.; and Brown, Ronald L., 4,427,852, Cl. 200-44.000.
Brown, Sam. Mortarless concrete block system having reinforcing bond beam courses. 4,426,815, Cl. 52-100.000.
Brown, Stephen T., to Boeing Commercial Airplane Company. Variable camber flap end seal. 4,427,169, Cl. 244-219.000.
Brown, Walter L. Denitrifice encapsulation. 4,427,116, Cl. 206-530.000.
Brownawell, Darrell W.; Gutierrez, Antonio; Matthews, Patricia C.; and Walker, Thad O., to Exxon Research & Engineering Co. Additive composition for release of stuck drill pipe. 4,427,564, Cl. 252-8.55R.
Brownlee, Sherwood S.: *See*—
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Bruck, Dieter W.; Jeblick, Werner; Konigshofen, Heinrich; Roos, Ernst; and Ruetz, Lother, to Bayer Aktiengesellschaft. Open-chain acetals or ketals as non-discoloring antiozonants for rubber. 4,427,817, Cl. 524-367.000.

Brudi Equipment, Inc.: *See*—
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Brudi, Ronald A.: *See*—
Matthewson, Randall W.; Benefiel, Earl H.; and Brudi, Ronald A., 4,427,117, Cl. 211-13.000.

Brule, Gerard: *See*—
Maubois, Jean-Louis; Roger, Loic; Brule, Gerard; and Piot, Michel, 4,427,658, Cl. 424-177.000.

Bruna, Charles; and Bruna, Lynn. Grain drill trailer. 4,427,211, Cl. 280-402.000.

Bruna, Lynn: *See*—
Bruna, Charles; and Bruna, Lynn, 4,427,211, Cl. 280-402.000.

Brundage, Richard B.: *See*—
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Brunn, Louis W.; and Lopez, Jaime, to Gulf Research & Development Company. Production of jet and diesel fuels from highly aromatic oils. 4,427,534, Cl. 208-89.000.

Bruns, Hartmut, to Siemens Aktiengesellschaft. Circuit arrangement for securing the supply voltage supply of an electronic load. 4,427,899, Cl. 307-66.000.

Bryan, Ernest C.: *See*—
Gillette, Frank C., Jr.; Bryan, Ernest C.; and Nethaway, Douglas H., 4,427,304, Cl. 374-46.000.

Bucaro, Joseph A.: *See*—
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Buchanan, Vernon G., to Microsize, Inc. Computer controlled microfilm camera system. 4,427,292, Cl. 355-54.000.

Buchel, Karl H.: *See*—
Kraatz, Udo; Stettier, Jorg; Buchel, Karl H.; Frohberger, Paul-Ernst; and Brandes, Wilhelm, 4,427,672, Cl. 424-245.000.
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Buchholz, Matthew: *See*—
Chen, Gilbert K.; Nyberg, Paul M.; and Buchholz, Matthew, 4,427,606, Cl. 261-111.000.

Buchtel, Michael E.; and Honda, Ronald T., to Ford Aerospace & Communications Corporation. Optical scanning apparatus incorporating counter-rotation of elements about a common axis by a common driving source. 4,427,878, Cl. 250-203.00R.

Buckle, Derek R.; and Smith, Harry, to Beecham Group Limited. Pharmacologically active benzopyranotriazole compounds. 4,427,686, Cl. 424-269.000.

Budzynski, Andrei Z.: *See*—
Olexa, Stephanie A.; Knight, Linda C.; and Budzynski, Andrei Z., 4,427,646, Cl. 424-1.100.

Buhrmann, Gerardus P., to Estel Hoogovens B.V. Liquid-cooled lance for blowing oxygen onto a steel bath. 4,427,186, Cl. 266-225.000.

Bui, Tuan S.; and Sherlock, John A., to Ausonics Pty. Ltd. Ultrasound transducer for enhancing signal reception in ultrasound equipment. 4,427,912, Cl. 310-322.000.

Bunting, Thomas G.; Centrone, Dominic A.; Sackler, Richard S.; and Halpern, Alfred, to Euroceltique, S.A. Povidone irradiation. 4,427,631, Cl. 422-22.000.

Burdette, George W.; and Hall, Lewis, to United States of America, Navy. Low viscosity air breathing missile fuel. 4,427,467, Cl. 149-109.400.

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Burger, Raymond. Process for the repeated fabrication of a structure. 4,426,759, Cl. 29-407.000.

Burghartz, Hans K.: *See*—
Reinehr, Ulrich; Dross, Joachim; Herbertz, Toni; Jungverdorben, Hermann-Josef; and Burghartz, Hans K., 4,427,613, Cl. 264-206.000.

Burkemper, Richard L.; and Tambrella, Manuel F., to Creative Data Services, Inc. Shelf molding. 4,426,797, Cl. 40-16.400.

Burndy Corporation: *See*—
Collier, John C.; and Lehman, David L., 4,426,772, Cl. 29-742.000.

Burner Systems International, Inc.: *See*—
Long, Kelso M.; and Pharr, Leonard, 4,426,899, Cl. 83-188.000.

Burnham, Gerald: *See*—
Setliff, Jerry; Burnham, Gerald; Smith, Michael; and Hoffman, Richard D., 4,428,057, Cl. 364-521.000.

Burroughs Corporation: *See*—
Catiller, Robert D.; Harris, Craig W.; and Mathews, Ronald D., 4,428,043, Cl. 364-200.000.
Hazel, Robert L.; and Kammerud, John E., 4,428,069, Cl. 365-215.000.
Hazel, Robert L.; and Kammerud, John E., 4,428,075, Cl. 369-45.000.

Busch, Lloyd E.; and Henderson, Gerald O., to Ashland Oil, Inc. Demetallizing and decarbonizing heavy residual oil feeds. 4,427,539, Cl. 208-127.000.

Bush, Rodney D.; and Robbins, Medford D., to Procter & Gamble Company, The. Agents for preparing cross-linked polymers and paint and plastic compositions containing those agents. 4,427,835, Cl. 525-293.000.

Busse, Oswald; and Klesper, Hugo, to Passavant-Werke AG & Co. KG. Method for applying a secondary filter layer or precoat layer in a plate filter press, and plate filter press for performing the method. 4,427,554, Cl. 210-777.000.

Buth, Jimmy D.: *See*—
Brown, Keith E.; and Buth, Jimmy D., 4,427,549, Cl. 210-662.000.

Butler, David V.: *See*—
Orlowski, Jan A.; and Butler, David V., 4,427,799, Cl. 523-116.000.

Buzzi, John L., Jr. Apparatus for mounting elements on a slate, cedar shake or shingled roof. 4,426,813, Cl. 52-27.000.

C.R. Bard, Inc.: *See*—
Nunn, Donald E.; and Beveridge, Robert W., 4,427,013, Cl. 128-681.000.

Caci, Inc. - Federal: *See*—
Smith, David W.; and Gagnon, Francis M., 4,426,754, Cl. 24-17.0AP.

Cadee, Theodorus P. M.: *See*—
Hendriks, Emerie F. M.; and Cadee, Theodorus P. M., 4,427,401, Cl. 474-201.000.

Cahill, Lysle D.: *See*—
Kuehnle, Manfred R.; and Cahill, Lysle D., 4,427,999, Cl. 358-300.000.
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Cairns, James A.; Nelson, Robert L.; and Woodhead, James L., to United Kingdom Atomic Energy Authority. Method of coating steel substrates to reduce carbonaceous deposition thereon. 4,427,721, Cl. 427-376.500.

Caldwell, Harlan D.; and Schacter, Julius. Isolation of principal outer membrane protein and antigen of *Chlamydia trachomatis*. 4,427,782, Cl. 436-542.000.

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Calvin, Douglas J.: *See*—
Belanger, James A.; Wentworth, Robert J.; Calvin, Douglas J.; and Lapham, James M., 4,427,049, Cl. 160-199.000.

Calvin, Melvin: *See*—
Wohlgemuth, Roland; and Calvin, Melvin, 4,427,511, Cl. 204-157.10R.

Cameron, Allan M., Jr.; and Middleton, Charles G., to Camtron Systems, Inc. Automatic labeling system. 4,427,484, Cl. 156-361.000.

Campbell, Willis R., to Sperry Corporation. Baling machine with air spring means for maintaining apron tension. 4,426,833, Cl. 56-341.000.

Camplair, George M.: *See*—
Hogan, James E.; and Camplair, George M., 4,426,901, Cl. 83-861.000.

Camtron Systems, Inc.: *See*—
Cameron, Allan M., Jr.; and Middleton, Charles G., 4,427,484, Cl. 156-361.000.

Canada, Her Majesty the Queen in right of: *See*—
Duchesne, Gonzague L.; and Perrault, Guy, 4,427,468, Cl. 149-19.900.

Canada Wire and Cable Limited: *See*—
Ito, Rokuzo, 4,426,835, Cl. 57-127.700.

Canadian Patents & Dev. Ltd.: *See*—
Retnakaran, Arthur, 4,427,700, Cl. 424-324.000.

Cancio, Modesto-Manuel, to BBC Brown, Boveri and Company, Limited. High voltage power switch. 4,427,859, Cl. 200-148.00B.

Canon Kabushiki Kaisha: *See*—
Fujimura, Naoto; Tanaka, Takashi; Fujita, Takeshi; Matsumoto, Masakazu; Takebayashi, Norie; Takasu, Yoshio; and Ishikawa, Shozo, 4,427,753, Cl. 430-58.000.
Fujino, Masahisa; Sunouchi, Akio; Suzuki, Nobuyuki; and Suzuki, Ryuji, 4,427,282, Cl. 354-271.100.
Ikemori, Keiji, 4,427,268, Cl. 350-422.000.
Inoue, Shunzo; Nagasawa, Takeshi; Iwaya, Toshio; Kasuya, Michio; and Murata, Shinji, 4,426,883, Cl. 73-159.000.
Iwashita, Tomonori; Mashimo, Yukio; Fukahori, Hidehiko; and Watanabe, Yoshitaka, 4,427,280, Cl. 354-173.110.
Nagashima, Nao, 4,427,288, Cl. 355-14.00R.
Nishiyama, Keizo, 4,427,295, Cl. 356-371.000.
Suzuki, Takashi; Iizuka, Kiyoshi; Ohtaka, Keiji; and Mizutani, Hidemasa, 4,427,265, Cl. 350-321.000.
Yamada, Akira, 4,427,281, Cl. 354-219.000.

Canron Corporation: *See*—
Pearson, Eugene W.; and Pedersen, Arthur L., 4,426,873, Cl. 72-389.000.

Cantada, Edilberto, to Singer Company, The. Adjustable cushioning spring for a sewing machine. 4,426,943, Cl. 112-221.000.

Capital-Mercury Shirt Corp.: *See*—
Depriest, Lloyd, 4,427,139, Cl. 223-2.000.

Caprio, Joseph R.: *See*—
Smith, Philip L.; and Caprio, Joseph R., 4,427,253, Cl. 339-98.000.

Caprio, Samuel J., to United States of America, Navy. Radar clutter reduction by use of frequency-diverse, wideband pulse-compression waveforms. 4,427,982, Cl. 343-17.2PC.

Caray, Andre: *See*—
Chatelin, Jean-Pierre; and Caray, Andre, 4,427,103, Cl. 192-89.00B.

Cardoza, Albert C.; Dawley, Von M.; Diaz, Edgardo C.; Edson, Michael E.; Nelson, Jerry J.; Peters, Robert D.; Wear, Dennis R.; and Wier, Daniel H. Versatile lighting bar with dissimilar rotatable lights. 4,428,037, Cl. 362-250.000.

Carl Freudenberg, Firma: *See*—
Holzer, Helmut; and Ehrmann, Peter, 4,427,205, Cl. 277-134.000.

Carl Schmale KG: *See*—
Freermann, Johannes, 4,427,855, Cl. 200-61.130.

Carl-Zeiss-Stiftung: *See*—
Lang, Walter; Blaha, Erich; Schmauder, Roland; and Muchel, Franz, 4,427,269, Cl. 350-500.000.
Muller, Gerhard J., 4,427,889, Cl. 250-339.000.
Muller, Ortwin; and Vogel, Albrecht, 4,428,035, Cl. 362-224.000.
Carle, Jean C.: *See*—
Choquenet, Pierre; and Carle, Jean C., 4,427,546, Cl. 210-351.000.
Carlson, F. Paul; Blakemore, John S.; and Eror, Nicholas G., to Oregon Graduate Center. Method of making depthwise-oriented integrated circuit capacitors. 4,427,457, Cl. 148-1.500.
Carmody, Michael A., to Baker Oil Tools, Inc. Flapper type safety valve for subterranean wells. 4,427,071, Cl. 166-332.000.
Carollo, Jerome T.; and Waidelich, John A., Jr., to United States of America, Navy. Video image simulation apparatus. 4,427,977, Cl. 340-702.000.
Carpenter, Steven: *See*—
Briggs, Peter J.; and Carpenter, Steven, 4,427,425, Cl. 55-159.000.
Carpenter, William A.: *See*—
Coles, Robert E.; Compton, Douglas R.; Lawrence, Jack; and Carpenter, William A., 4,427,108, Cl. 206-44.00R.
Carpools Environmental Protection Services Ltd.: *See*—
Wilson, Gerald E., 4,426,995, Cl. 126-426.000.
Carrier Corporation: *See*—
Reedy, Wayne R., 4,426,850, Cl. 62-125.000.
Torniainen, Matti J., 4,426,868, Cl. 72-98.000.
Carswell, Angela M.: *See*—
Robinson, Joseph G.; Barnes, David I.; and Carswell, Angela M., 4,427,578, Cl. 502-177.000.
Carter, Charles P. Automatic fence picket stock conveyor for fence picket pointing machine. 4,427,330, Cl. 414-113.000.
Carter, Charles R., to Boeing Company, The. Noise, flash and smoke suppressor apparatus and method for rocket launcher. 4,426,909, Cl. 89-1.816.
Carter, Philip W.; and McLachlan, Kenneth. Method and apparatus for the generation of differential distal movement of teeth. 4,427,380, Cl. 433-5.000.
Carulli, Vincent J.: *See*—
Gerber, Heinz J.; Mishli, Yuval; Carulli, Vincent J.; and Cohen, Joseph H., 4,426,783, Cl. 33-1.00M.
Casio Computer Co., Ltd.: *See*—
Hasegawa, Minoru, 4,427,299, Cl. 368-29.000.
Ishibashi, Masanori, 4,426,904, Cl. 84-1.260.
Castagna, Erna. Sliding wall-unit furniture assembly. 4,427,244, Cl. 312-245.000.
Castoe, John H. Seal puller. 4,426,758, Cl. 29-265.000.
Cater, Leavie, Sr. Collapsible tent structure with elevated floor. 4,427,021, Cl. 135-109.000.
Caterpillar Tractor Co.: *See*—
Comer, Glen S., Jr.; and Eichler, Henry, 4,427,026, Cl. 137-556.000.
Catiller, Robert D.; Harris, Craig W.; and Mathews, Ronald D., to Burroughs Corporation. Data communications network. 4,428,043, Cl. 364-200.000.
Cavalleri, Bruno; and Selva, Enrico, to Gruppo Lepetit S.p.A. Antibiotic A/16686 factor A_2, the process for the preparation thereof and the co-produced antibiotic A/16686 factors A_1 and A_3. 4,427,656, Cl. 424-118.000.
Cefelin, Pavel: *See*—
Stol, Miroslav; Tolar, Miroslav; Adam, Milan; Cefelin, Pavel; and Kalal, Jaroslav, 4,427,808, Cl. 524-24.000.
Celanese Corporation: *See*—
Zimmerman, Daniel; and Lu, Shau-Zou, 4,427,807, Cl. 523-466.000.
Cemen-Tech, Inc.: *See*—
Stastny, Joseph F., 4,427,297, Cl. 366-19.000.
Central Glass Company Limited: *See*—
Yoshikawa, Seizi; and Nakamura, Ryuichi, 4,427,641, Cl. 423-18.000.
Centrone, Dominic A.: *See*—
Bunting, Thomas G.; Centrone, Dominic A.; Sackler, Richard S.; and Halpern, Alfred, 4,427,631, Cl. 422-22.000.
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Champion International Corporation: *See*—
Seiter, George M.; and Gould, Richard, 4,427,148, Cl. 229-43.000.
Chan, Rosalind P. K., to Biorex Laboratories Limited. 1,2-Diphenylethane derivatives. 4,427,697, Cl. 424-311.000.
Chandler, Richard N., to Schlumberger Technology Corporation. System for permeability logging by measuring streaming potentials. 4,427,944, Cl. 324-353.000.
Chang, Clarence D.: *See*—
Miale, Joseph N.; and Chang, Clarence D., 4,427,786, Cl. 502-61.000.
Miale, Joseph N.; and Chang, Clarence D., 4,427,787, Cl. 502-71.000.
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Miale, Joseph N.; and Chang, Clarence D., 4,427,789, Cl. 502-71.000.
Miale, Joseph N.; and Chang, Clarence D., 4,427,790, Cl. 502-71.000.
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Chappell, Bennie. Digitally controlled drafting machine. 4,427,932, Cl. 318-574.000.
Chari, Venu; Duke, Jack R.; and Gersten, Shimon, to NCR Corporation. Data processing system having a star coupler with contention circuitry. 4,428,046, Cl. 364-200.000.
Charles, Magalie M., to Du Pont de Nemours, E. I., and Company. Process for surface improvement of surprint proof with transparentized particulate material. 4,427,761, Cl. 430-291.000.
Charles Stark Draper Laboratory, Inc., The: *See*—
Schluntz, Roy A.; and Stemniski, John R., 4,426,889, Cl. 74-5.00R.
Charlesworth, David V.; and Smith, Derek F., to A. P. Besson Limited. Telephone transducers. 4,427,958, Cl. 335-231.000.
Charney, Andrew R.; Kercher, Paul W.; and Stone, Stanley A., to Scientific Systems, Inc. Pulse damper for chromostography systems. 4,427,029, Cl. 138-30.000.
Charpin, Jean; LaRat, Bernard; Marcel, Raymond; and Plurien, Pierre, to Commissariat a l'Energie Atomique. Isotope separation apparatus and process. 4,427,424, Cl. 55-158.000.
Chatelin, Jean-Pierre; and Caray, Andre, to Valeo. Diaphragm clutch mechanism, particularly for a motor vehicle. 4,427,103, Cl. 192-89.00B.
Chattin, Robert A., to Advanced Instrument Development, Inc. Mobile ionization chamber with portable power supply packaged in insulated housing. 4,427,946, Cl. 328-7.000.
Chedid, Louis: *See*—
Le Francier, Pierre; Audibert, Francoise; Choay, Jean; Chedid, Louis; and Lederer, Edgar, 4,427,659, Cl. 424-177.000.
Cheetham, Jeffery J. Dental amalgam alloy. 4,427,628, Cl. 420-504.000.
Chemische Werke Huls AG: *See*—
Hofmann, Peter; and Muller, Wolfgang H. E., 4,427,593, Cl. 260-410.90R.
Chen, Gilbert K.; Nyberg, Paul M.; and Buchholz, Matthew, to Koch Engineering Company, Inc. Vapor-liquid contact grid. 4,427,606, Cl. 261-111.000.
Chen, Li F.; Gong, Cheng S.; and Tsao, George T., to Purdue Research Foundation. Mycelial pellets having a support core. 4,427,775, Cl. 435-161.000.
Chen, Shuenn-tzong; Sherwood, Mark J.; and Warchal, Mary E., to Miles Laboratories, Inc. High glucose-determining analytical element. 4,427,770, Cl. 435-14.000.
Chen, Wen T.; and Oxley, Vincent C., to GTE Laboratories Incorporated. Current monitoring apparatus. 4,428,021, Cl. 361-94.000.
Chen, Yok; Gonzalez, Roberto; and Summers, Geoffrey P., to United States of America, Energy. High-quantum efficiency, long-lived luminescing refractory oxides. 4,427,570, Cl. 252-301.40R.
Cheney, Peter A.; Stares, John; and Vernon, Alan J., to Mars Limited. Food product thickened or gelled with carrageenan and glucomannan. 4,427,704, Cl. 426-104.000.
Chervenak, Michael C.: *See*—
Nongbri, Govanon; Brandt, Susan M.; and Chervenak, Michael C., 4,427,535, Cl. 208-112.000.
Chevron Research Company: *See*—
Ho, Andrew W., 4,427,667, Cl. 424-210.000.
Klaassen, Alan W.; and Bezman, Richard D., 4,427,536, Cl. 208-113.000.
Chiba, Hisashi: *See*—
Yagi, Norio; Chiba, Hisashi; Mitsuda, Yutaka; Sakano, Yasuaki; and Aikawa, Masaki, 4,427,832, Cl. 525-238.000.
Chiba, Toshiyuki: *See*—
Takaya, Takao; Takasugi, Hisashi; Tsuji, Kiyoshi; and Chiba, Toshiyuki, 4,427,674, Cl. 424-246.000.
Chierici, Osvaldo F., to Holland Co. Method of making composite spin welded coupler carrier assembly. 4,427,471, Cl. 156-73.500.
Chillis, Robert L. Brake lock for motorcycles and the like. 4,426,861, Cl. 70-39.000.
Chirash, William; and Wixon, Harold E., to Colgate-Palmolive Company. Fabric softening composition containing molecular sieve zeolite. 4,427,410, Cl. 8-137.000.
Chisvette, Dominick; Lattimore, James; and Patterson, Donald M., to Inmont Corporation. Continuous method of producing aqueous phthalocyanine pigment dispersions. 4,427,810, Cl. 524-88.000.
Chloe Chimie: *See*—
Guillaumont, Jacques, 4,427,521, Cl. 204-275.000.
Choay, Jean: *See*—
Le Francier, Pierre; Audibert, Francoise; Choay, Jean; Chedid, Louis; and Lederer, Edgar, 4,427,659, Cl. 424-177.000.
Cholet, Jacques, to Institut Francais du Petrole. Supporting system for apparatuses destined to be moved under water. 4,426,950, Cl. 114-245.000.
Choquenet, Pierre; and Carle, Jean C., to Societe L. Choquenet (S.A.). Filtration devices. 4,427,546, Cl. 210-351.000.
Choy, Andrew L.: *See*—
Lee, Noel; and Choy, Andrew L., 4,427,252, Cl. 339-89.00R.
Christie, Walter E., to Avco Corporation. Device for stripping wire and cable. 4,426,778, Cl. 30-90.100.
Chuzawa, Takaaki, to Matsushita Electric Works, Ltd. Circuit protecting sensor. 4,427,959, Cl. 335-239.000.
Ciba-Geigy A.G.: *See*—
Bauerle, Rolf, 4,427,413, Cl. 8-471.000.
Ciba-Geigy Corporation: *See*—
Allgeier, Hans; and Gagneux, Andre, 4,427,590, Cl. 260-245.500.
Beffa, Fabio, 4,427,585, Cl. 260-151.000.
Hubele, Adolf, 4,427,696, Cl. 424-309.000.
Lorenz, Joachim; and Grade, Reinhardt, 4,427,435, Cl. 71-67.000.
Puntener, Alois, 4,427,411, Cl. 8-404.000.
von der Crone, Jost; and Sieber, Werner, 4,427,752, Cl. 430-37.000.

Cilento, Rudolfo D.; Riffkin, Charles; and LaVia, Anthony L., to E. R. Squibb & Sons, Inc. Microporous adhesive tape. 4,427,737, Cl. 428-315.700.
Ciminiello, Francisco J.: *See—*
Di Giovanni, Bernard A.; and Ciminiello, Francisco J., 4,427,031, Cl. 138-97.000.
Di Giovanni, Bernard A.; and Ciminiello, Francisco J., 4,427,032, Cl. 138-98.000.
Di Giovanni, Bernard A.; and Ciminiello, Francisco J., 4,427,112, Cl. 206-223.000.
Citizen Watch Company Limited: *See—*
Watanabe, Shinichi, 4,427,302, Cl. 368-200.000.
Claas OHG: *See—*
Fredriksen, Nils; and Wecker, Heinrich, 4,427,090, Cl. 180-327.000.
Wesselmann, Winfried, 4,426,826, Cl. 56-13.300.
Clark, William E.: *See—*
Evans, Joseph H.; Hatman, Jeffrey J.; and Clark, William E., 4,426,999, Cl. 126-450.000.
Clements, Anthony H., to Lever Brothers Company. Washing compositions containing organic peracid bleaches or their precursors and iodide ion donors. 4,427,566, Cl. 252-102.000.
Clements, Shannon K. Hydraulic valve control for aerial book devices. 4,427,121, Cl. 212-231.000.
Clerc, Jean F.; and Robert, Jacques. Process for the control of an optical characteristic of a material by signals of increasing time periods. 4,427,979, Cl. 340-805.000.
Clesix, Willy, to Ebauches Electroniques S.A. Timepiece with an activating mechanism. 4,427,301, Cl. 368-72.000.
Cleveland, Patrick H. Manifold vacuum biochemical test method and device. 4,427,415, Cl. 436-57.000.
Cloarec, Rene: *See—*
Price, John G. W.; and Cloarec, Rene, 4,426,878, Cl. 73-55.000.
Clopay Corporation: *See—*
Toppes, John D., 4,427,050, Cl. 160-315.000.
Cloutier, Paul A.; Oehme, Delbert R.; and Stebbings, Ronald F., to Innovatum, Inc. Apparatus and method for locating and tracking magnetic objects or sources. 4,427,943, Cl. 324-326.000.
Coal Industry (Patents) Limited: *See—*
Lord, Peter M., 4,427,976, Cl. 340-604.000.
Robinson, Joseph G.; Barnes, David I.; and Carswell, Angela M., 4,427,578, Cl. 502-177.000.
Coats, John H.: *See—*
Whaley, Howard A.; Snyder, William C.; Greenfield, John C.; and Coats, John H., 4,427,776, Cl. 435-169.000.
Coetzee, John C. Dispensing and metering devices for liquids. 4,427,041, Cl. 141-294.000.
Cohen, Joseph H.: *See—*
Gerber, Heinz J.; Mishli, Yuval; Carulli, Vincent J.; and Cohen, Joseph H., 4,426,783, Cl. 33-1.00M.
Cohen, Marshall J.: *See—*
Waldrop, James R.; and Cohen, Marshall J., 4,427,840, Cl. 136-255.000.
Coherent, Inc.: *See—*
Saunders, Richard J., 4,427,872, Cl. 219-121.0LH.
Cole, Martin; Howarth, Thomas T.; and Reading, Christopher, to Beecham Group Limited. Esters of clavulanic acid. 4,427,690, Cl. 424-272.000.
Coleman, Donald J.; Jackson, Wilbur C.; Lube, Robert R.; and Spohr, Albert R., to Sunbeam Corporation. Electric dry shaver. 4,426,777, Cl. 30-34.200.
Coles, Robert E.; Compton, Douglas R.; Lawrence, Jack; and Carpenter, William A., to General Foods Limited. Stackable display unit. 4,427,108, Cl. 206-44.00R.
Colgate-Palmolive Company: *See—*
Benz, Claude L., 4,427,567, Cl. 252-116.000.
Chirash, William; and Wixon, Harold E., 4,427,410, Cl. 8-137.000.
Gaffar, Abdul, 4,427,652, Cl. 424-52.000.
Karami, Hamzeh; Haulait, Claude; and Cooper, Terence, 4,427,408, Cl. 604-393.000.
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Collet-Cassart, Daniel: *See—*
Masson, Pierre L.; Collet-Cassart, Daniel; and Magnusson, Carl G., 4,427,781, Cl. 436-509.000.
Collet, Peter J., to Nederlandse Centrale Organisatie Voor Toegepast-Natuurwetenschappelijk Onderzoek. System for heat recovery for combustion machine including compressor for combustion air. 4,426,842, Cl. 60-39.511.
Collier, John C.; and Lehman, David L., to Burndy Corporation. Apparatus for installing terminals on wires and insulation pods on terminals. 4,426,772, Cl. 29-742.000.
Collins, Gilbert C.; and Schiffrin, David J., to International Business Machines Corporation. Metal diphthalocyanine electrochromic displays and electrolytes therefor. 4,427,267, Cl. 350-357.000.
Colt Industries Operating Corp.: *See—*
Tung, Wayne Y., 4,426,979, Cl. 123-478.000.
Combustion Engineering, Inc.: *See—*
Winship, Ralph D., 4,426,939, Cl. 110-347.000.
Comer, Glen S., Jr.; and Ejchler, Henry, to Caterpillar Tractor Co. Limit control for an operating member. 4,427,026, Cl. 137-556.000.
Commissariat a l'Energie Atomique: *See—*
Abbes, Claude; Rouaud, Christian; Piednoir, Robert; and De Villepoix, Raymond, 4,427,222, Cl. 285-353.000.
Charpin, Jean; LaRat, Bernard; Marcel, Raymond; and Plurien, Pierre, 4,427,424, Cl. 55-158.000.
Jarniac, Roger, 4,426,912, Cl. 91-39.000.
Schnedecker, Guy, 4,426,762, Cl. 29-527.400.
Commonwealth Scientific and Industrial Research Organization: *See—*
Priestley, Anthony J., 4,427,550, Cl. 210-675.000.
Communications Technology Corporation: *See—*
Smith, Donald J., 4,427,248, Cl. 339-14.00R.
Compagnie des Montres Longines: *See—*
Groothuis, Michel, 4,427,300, Cl. 368-37.000.
Comploi, Georg; Heimgartner, Roland; Loacker, Artur; Huber, Kurt; and Wallimann, Hans, to Aktiengesellschaft Adolf Saurer. Embroidery machine pattern mechanism. 4,426,941, Cl. 112-84.000.
Comptoir Lyon-Alemand Louyot: *See—*
Guerlet, Jean-Paul; and Niney, Claude, 4,427,627, Cl. 420-496.000.
Compton, Douglas R.: *See—*
Coles, Robert E.; Compton, Douglas R.; Lawrence, Jack; and Carpenter, William A., 4,427,108, Cl. 206-44.00R.
Conerly, Robert C. Centering tool. 4,426,786, Cl. 33-180.00R.
Conger/Murray Systems, Inc.: *See—*
Murray, John A., 4,427,610, Cl. 264-82.000.
Connell, James. Vehicle wheel trim. 4,427,238, Cl. 301-37.00P.
Conrad, Peter, to Fiber Industries, Inc. Apparatus for removing filled packages from a filament winder and installing empty tubes on the winder. 4,427,158, Cl. 242-35.50A.
Constantinescu, Serban: *See—*
Constantinescu, Spiridon; and Constantinescu, Serban, 4,427,177, Cl. 251-230.000.
Constantinescu, Spiridon; and Constantinescu, Serban. Shower control. 4,427,177, Cl. 251-230.000.
Container Corporation of America: *See—*
Tuitt, Milton J., 4,427,125, Cl. 215-231.000.
Container Products Corporation: *See—*
Teague, Lyndon M., 4,426,927, Cl. 100-219.000.
Continental Can Company, Inc.: *See—*
Pan, Peter N. Y., 4,427,712, Cl. 427-13.000.
Continental Group, Inc., The: *See—*
Beck, Martin H.; Krishnakumar, Suppayan M.; and Harry, Ieuan L., 4,427,476, Cl. 156-199.000.
Heyn, William M., 4,427,128, Cl. 220-270.000.
Control Fluidics, Inc.: *See—*
Brown, Robert L.; and Tufts, Wesley M., 4,427,555, Cl. 210-805.000.
Cook, Bruce M., to Westinghouse Electric Corp. Nuclear reactor power supply. 4,427,620, Cl. 376-216.000.
Cook, Evin L., to Mobil Oil Corporation. Oil recovery method. 4,427,066, Cl. 166-261.000.
Cook, John W.: *See—*
Meilenner, Norbert J.; Sunderland, Richard T.; and Cook, John W., 4,426,837, Cl. 57-293.000.
Cooper, Clinton V. Frame for tamper proofing a meter housing. 4,427,172, Cl. 248-551.000.
Cooper, Terence: *See—*
Karami, Hamzeh; Haulait, Claude; and Cooper, Terence, 4,427,408, Cl. 604-393.000.
Copeland Corporation: *See—*
Elson, John P., 4,427,349, Cl. 417-363.000.
Copie, Fernand; Esterberg, Warren E.; Fadness, Quentin K.; Stewart, Howard A.; and Ringwelski, Robert J., to RayGo, Inc. Load handling apparatus. 4,427,334, Cl. 414-710.000.
Coppa, Ivo. Process and system for drying products and materials, such as wood. 4,426,791, Cl. 34-27.000.
Coppelmans, Petrus M. C.: *See—*
van Roermund, Arthur H. M.; and Coppelmans, Petrus M. C., 4,428,070, Cl. 365-222.000.
Coppola, Vincent G.; and Lorenzo, John L., to Pitney Bowes Inc. Interface circuit for a meter reading device. 4,427,969, Cl. 340-347.0AD.
Core Laboratories, Inc.: *See—*
Price, John G. W.; and Cloarec, Rene, 4,426,878, Cl. 73-55.000.
Cornelius, Walter; and Klomp, Edward D., to General Motors Corporation. Gas turbine combustor assembly. 4,426,841, Cl. 60-39.230.
Cornell Research Foundation, Inc.: *See—*
Kinsella, John E.; and Srinivasan, Damodaran, 4,427,580, Cl. 260-112.00R.
Corning Glass Works: *See—*
Allaire, Roger A.; and Simonson, Edwin J., 4,427,430, Cl. 65-41.000.
Belmonte, James A.; and Hillman, Arthur E., 4,427,728, Cl. 428-117.000.
Montierth, Max R., 4,427,423, Cl. 55-97.000.
Ure, Dennis J.; Wilder, Arthur H.; and Wilson, Richmond W., 4,426,996, Cl. 126-443.000.
Corrigan, James L.; Howett, Deborah L.; and Schouten, Gerard M., to Armstrong World Industries, Inc. Carpet display stand. 4,427,118, Cl. 211-45.000.
Coulter Systems Corporation: *See—*
Kuehnle, Manfred R.; and Cahill, Lysle D., 4,427,999, Cl. 358-300.000.
Kuehnle, Manfred R.; and Cahill, Lysle D., 4,428,000, Cl. 358-300.000.
Covi, Christian: *See—*
Poll, Martin; and Covi, Christian, 4,427,733, Cl. 428-200.000.
Covington, Cecil E.: *See—*
Metzger, Robert W.; Neathery, William D.; Reyes, Peter A.; Tisdale, Patrick R.; Covington, Cecil E.; and Broekhuizen, Willem, 4,427,340, Cl. 416-141.000.

Cox, Charles W., to General Electric Company. Plastic based glass halogen lamp. 4,427,255, Cl. 339-127.00C.

Crawford, Micheal B., to Dresser Industries, Inc. Rotary rock bit with independently true rolling cutters. 4,427,081, Cl. 175-376.000.

Creative Data Services, Inc.: *See*—
Burkemper, Richard L.; and Tambrella, Manuel F., 4,426,797, Cl. 40-16.400.

Crisp, Robert L., Jr., to Facet Enterprises, Inc. Temperature compensated differential pressure indicating device. 4,426,952, Cl. 116-267.000.

Crofts, David, to Raychem Limited. Dimensionally-recoverable article. 4,427,725, Cl. 428-36.000.

Cronbeen, Jacobus E.; Visser, Jan; and Thomas, Gary E., to U.S. Philips Corporation. Magnetron cathode sputtering system. 4,427,524, Cl. 204-298.000.

Cronin, Dennis C., to Beloit Corporation. Extended nip shoe for a nip in papermaking machine. 4,427,492, Cl. 162-358.000.

Crosby, Edward L., Jr., to RCA Corporation. Strain measurement. 4,426,875, Cl. 73-12.000.

Crosby, Edwin J.; and Oroskar, Anil R., to Wisconsin Alumni Research Foundation. Method and apparatus for spray fractionation of particles in liquid suspension. 4,427,541, Cl. 209-210.000.

Csepel Muvek Jarmu es Konfekcioipari Gepgyara: *See*—
Olasz, Sandor; Szalay, Denes; Kovacs, Jozsef; and Kocsis, Oliver, 4,426,948, Cl. 112-273.000.

CTS Corporation: *See*—
Stuckey, Ronald L., 4,426,774, Cl. 29-841.000.

Culwell, Charles W. Apple corer with safety feature. 4,426,924, Cl. 99-545.000.

Cummins Engine Company, Inc.: *See*—
Patel, Harshad H., 4,426,965, Cl. 123-196.0AB.

Curley, Paul E.; and Hirschmann, Ralph F., to Merck & Co., Inc. Fluorinated cyclic hexapeptide somatostatin analogs. 4,427,661, Cl. 424-177.000.

Currer, John T.: *See*—
Kielma, Ervin J.; Schabowski, Albin J.; and Currer, John T., 4,427,325, Cl. 409-144.000.

Curtiss-Wright Corporation: *See*—
Hosek, William S.; and Garruto, Edward J., 4,426,958, Cl. 122-4.00D.

Czarnik, Richard J.: *See*—
Galis, Leon A.; and Czarnik, Richard J., 4,426,970, Cl. 123-364.000.

D. Swarovski & Co.: *See*—
Poll, Martin; and Covi, Christian, 4,427,733, Cl. 428-200.000.

Daikin Kogyo Co., Ltd.: *See*—
Fukui, Shoshin; Shinjo, Masayoshi; and Aoyama, Hirokazu, 4,427,803, Cl. 523-402.000.

Daimler-Benz A.G.: *See*—
Augustin, Ulrich, 4,427,347, Cl. 417-296.000.
Bauer, Wilhelm; Haberle, Fritz; and Riechers, Daniel, 4,427,225, Cl. 293-132.000.

Dainippon Ink & Chemicals, Inc.: *See*—
Yamada, Fumiyoshi; and Hiraishi, Shunichi, 4,427,482, Cl. 156-307.300.

Daiwa Seiko Inc.: *See*—
Sakumoto, Akinori, 4,427,161, Cl. 242-84.20A.

Daley, Gregory C.: *See*—
Walters, John P.; Petrovich, Radomir; Daley, Gregory C.; and Harban, Donald C., 4,426,880, Cl. 73-61.200.

Daly, Charles F.: *See*—
Guimond, Roy A.; Daly, Charles F.; and Gulliksen, John E., 4,428,039, Cl. 362-287.000.

Dambrine, Francis; and Ghestem, Gerard, to Fives-Cail Babcock. Installation for the dry manufacture of cement. 4,427,377, Cl. 432-106.000.

D'Amico, John J., to Monsanto Company. N-Substituted xanthate benzothiazoline and related derivatives. 4,427,436, Cl. 71-88.000.

D'Andrade, Bruce M., to Arco Industries Ltd. Toy coin changer. 4,427,389, Cl. 434-110.000.

Danfoss A/S: *See*—
Romer, Bendt W., 4,427,346, Cl. 417-292.000.

Daniels, Peter, to United States of America, Navy. Stabilizing apparatus for an air launched weapon. 4,427,167, Cl. 244-3.240.

Dannatt, Hugh S. L., to Pitney Bowes Inc. Adjustment means for fiber optic illuminator. 4,427,284, Cl. 355-1.000.

Dart Industries, Inc.: *See*—
Holzl, Robert A.; Benander, Robert E.; and Davis, Robert D., 4,427,445, Cl. 75-234.000.

Data General Corporation: *See*—
Davidian, Gary, 4,428,045, Cl. 364-200.000.

Dataproducts Corporation: *See*—
Jezbera, Val K., 4,426,930, Cl. 101-93.140.

Davey, Keith S. A., to PA Management Consultants Limited. Thin films of compounds and alloy compounds of Group III and Group V elements. 4,427,714, Cl. 427-87.000.

David, John G., to Lever Brothers Company. Fabric conditioning materials. 4,427,558, Cl. 252-8.800.

Davidian, Gary, to Data General Corporation. Apparatus for specifying and resolving addresses of operands in a digital data processing system. 4,428,045, Cl. 364-200.000.

Davies, John S.: *See*—
Zomaya, Iskander I.; and Davies, John S., 4,427,689, Cl. 424-272.000.

Davis, Robert D.: *See*—
Holzl, Robert A.; Benander, Robert E.; and Davis, Robert D., 4,427,445, Cl. 75-234.000.

Dawley, Von M.: *See*—
Cardoza, Albert C.; Dawley, Von M.; Diaz, Edgardo C.; Edson, Michael E.; Nelson, Jerry J.; Peters, Robert D.; Wear, Dennis R.; and Wier, Daniel H., 4,428,037, Cl. 362-250.000.

Day, Joseph G., to Johnson Matthey Public Limited. Recovery of platinum group metals, gold and silver from scrap. 4,427,442, Cl. 75-10.00R.

Day, Pierce B., to Eastman Kodak Company. Compact optical imaging apparatus. 4,427,291, Cl. 355-46.000.

De Rotterdamsche Droogdok MIJ B.V.: *See*—
Wolters, Henk R.; and Sillem, Paul, 4,427,078, Cl. 173-126.000.

De Aberasturi, Doreoteo J., to Agrator, S.A. Tubular spike carrying shaft. 4,427,076, Cl. 172-548.000.

Dean, James C.; and Barnett, Eugene R. Fastening means. 4,426,816, Cl. 52-202.000.

Dean, Robert R.; Mauleon, Jean L.; and Newman, Robert J. Method and means for preparing and dispersing atomed hydrocarbon with fluid catalyst particles in a reactor zone. 4,427,537, Cl. 208-120.000.

Decaux, Jean-Francois. Motorcycle for cleaning the ground. 4,426,748, Cl. 15-83.000.

Decision Data Computer Corporation: *See*—
Miller, Robert J., 4,427,243, Cl. 312-7.200.

Decker, Maurice S., to Midland-Ross Corporation. Flexible joint for conduit. 4,427,220, Cl. 285-263.000.

de Coiselet (de F.), Claude. Vehicle fitted with an auxiliary wheel for propelling, guiding and or braking the vehicle. 4,427,086, Cl. 180-119.000.

Decor Noel Corp.: *See*—
Roberts, Harold S.; and Weber, Zigfried, 4,427,354, Cl. 425-155.000.

Deere & Company: *See*—
Soteropulos, Gust S.; and Anstey, Henry D., 4,426,926, Cl. 100-88.000.

Degrassi, Alfieri; Sacks, William; Sibilia, John P.; Kotliar, Abraham M.; and Mason, Charles D., to Allied Corporation. Blends of polyamide and ethylene vinyl alcohol copolymers. 4,427,825, Cl. 525-56.000.

de Kermadec, Alain; Delanoe, Christian; and Normand, Gerard, to Societe Anonyme dite Compagnie Industrielle des Telecommunications CIT-Alcatel. Image print head. 4,427,988, Cl. 346-155.000.

Delanoe, Christian: *See*—
de Kermadec, Alain; Delanoe, Christian; and Normand, Gerard, 4,427,988, Cl. 346-155.000.

DeMarco, Joseph P. Terminal insulator. 4,427,257, Cl. 339-184.00R.

Demarest, Frank C.; and Iderosa, Richard A., to Zygo Corporation. Electro-optical measuring system. 4,427,296, Cl. 356-387.000.

DeMaria, Anthony J.: *See*—
Black, James F.; Grudkowski, Thomas W.; and DeMaria, Anthony J., 4,426,768, Cl. 29-583.000.

Denis, Michel, to Stein Heurtey Societe Anonyme. Supports for products in a steel-making furnace. 4,427,187, Cl. 266-274.000.

Denki Kagaku Kogyo Kabushiki Kaisha: *See*—
Yagi, Norio; Chiba, Hisashi; Mitsuda, Yutaka; Sakano, Yasuaki; and Aikawa, Masaki, 4,427,832, Cl. 525-238.000.

Dennis, Charles H., Jr. Window washing kit. 4,427,140, Cl. 224-148.000.

Depriest, Lloyd, to Capital-Mercury Shirt Corp. Collar pressing method and apparatus. 4,427,139, Cl. 223-2.000.

DeSantis, Raymond P.; and Puffer, Herbert J., Jr., to PTX-Pentronix, Inc. Mounting structure for die, punch and core rod assembly for compacting powder material. 4,427,352, Cl. 425-78.000.

DeSoto, Inc.: *See*—
Tortorello, Anthony J.; and Kinsella, Mary A., 4,427,804, Cl. 523-404.000.

Detroit-Armor Corporation: *See*—
Nikoden, Joseph, Jr., 4,426,935, Cl. 109-79.000.

Deutsche Babcock Anlagen Aktiengesellschaft: *See*—
Mayr, Heribert, 4,427,319, Cl. 405-196.000.

DeVecchi, Francisco, to Veco S.A. Vertical laminar flow filter module. 4,427,427, Cl. 55-358.000.

De Villepoix, Raymond: *See*—
Abbes, Claude; Rouaud, Christian; Piednoir, Robert; and De Villepoix, Raymond, 4,427,222, Cl. 285-353.000.

Devol, George C., to Unimation, Inc. Encoding apparatus. 4,427,970, Cl. 340-347.00P.

de Vries, Hans; Birkle, Siegfried; Stoeger, Klaus; and Gehring, Johann, to Siemens Aktiengesellschaft. Electroplating device. 4,427,518, Cl. 204-201.000.

de Vries, Hans: *See*—
Birkle, Siegfried; Stoger, Klaus; Gehring, Johann; and de Vries, Hans, 4,427,522, Cl. 204-279.000.

Dhingra, Vijay K., to Raychem Corporation. Printing on low surface energy polymers. 4,427,877, Cl. 219-548.000.

Diamond Shamrock Corporation: *See*—
Bennett, John E.; and Harney, David E., 4,427,747, Cl. 429-50.000.

Diaz, Edgardo C.: *See*—
Cardoza, Albert C.; Dawley, Von M.; Diaz, Edgardo C.; Edson, Michael E.; Nelson, Jerry J.; Peters, Robert D.; Wear, Dennis R.; and Wier, Daniel H., 4,428,037, Cl. 362-250.000.

Dickakian, Ghazi, to Exxon Research and Engineering Co. Aromatic pitch derived from a middle fraction of a cat cracker bottom. 4,427,530, Cl. 208-22.000.

Dickakian, Ghazi, to Exxon Research and Engineering Co. Process for deasphaltenating cat cracker bottoms and for production of anisotropic pitch. 4,427,531, Cl. 208-40.000.

Dickinson, Robert J.; Wasko, John; and Pennell, William E., to United States of America, Energy. Bearing for liquid metal pump. 4,427,337, Cl. 415-113.000.

Dickran Babigian, Trustee: *See*—
MacDonald, Paul M., 4,427,246, Cl. 312-330.00R.
Di Giovanni, Bernard A.; and Ciminiello, Francisco J. Method of installing an interior by-pass liner. 4,427,031, Cl. 138-97.000.
Di Giovanni, Bernard A.; and Ciminiello, Francisco J. Service line interior by-pass. 4,427,032, Cl. 138-98.000.
Di Giovanni, Bernard A.; and Ciminiello, Francisco J. Service line interior by-pass kit. 4,427,112, Cl. 206-223.000.
Dillenburg, Helmut: *See*—
Doetsch, Werner; Dillenburg, Helmut; Fuchs, Paul-Wilhelm; and Honig, Helmut, 4,427,644, Cl. 423-582.000.
Dills, Raymond L., to General Electric Company. Power divider for microwave oven. 4,427,867, Cl. 219-10.55F.
Dingle, John T.; Gordon, John L.; Jones, Geraint; Knight, Clive G.; and Lowe, John S., to Imperial Chemical Industries Limited; and National Research Development Corporation. Pharmaceutical compositions. 4,427,649, Cl. 424-38.000.
Dion, Exsior. Apparatus for use in arm wrestling or wrist pulling contests. 4,427,194, Cl. 273-1.0GC.
Di Rosa, Gaetano, to Fata European Group S.p.A. Fluidized bed furnace. 4,427,375, Cl. 432-58.000.
Dittmann, Norbert: *See*—
Kahlert, Peter; Schone, Helmut; Johse, Hans; Jentzsch, Arndt; Hefftler, Victor; Kuhnert, Werner; Karl, Rainer; Dittmann, Norbert; Fink, Heiner; and Preusger, Karl-Heinz, 4,427,193, Cl. 271-277.000.
DMA Sytems Corporation: *See*—
Sutton, David A., 4,427,905, Cl. 310-13.000.
Dnepropetrovsky Gorny Institut Imeni Artema: *See*—
Toropov, Gennady A.; Shamenko, Stepan P.; Tsvirko, Georgy L.; Oleinichenko, Viktor G.; Khitun, Georgy A.; and Menyailenko, Anatoly I., 4,426,870, Cl. 72-118.000.
Do-All Jewelry Mgf. Co., Inc.: *See*—
Geldwerth, Simon; and Rubin, Mendek, 4,426,854, Cl. 63-4.000.
Dr. Karl Thomae GmbH: *See*—
Brickl, Rolf; Gruber, Peter; Schepky, Gottfried; and Bozler, Gerhard, 4,427,648, Cl. 424-16.000.
Docutel Corporation: *See*—
Kushmaul, Richard T.; and Webb, James E., 4,427,192, Cl. 271-11.000.
Doetsch, Werner; Dillenburg, Helmut; Fuchs, Paul-Wilhelm; and Honig, Helmut, to Peroxid-Chemie GmbH. Process for the preparation of bivalent metal peroxides. 4,427,644, Cl. 423-582.000.
Dokmo, Richard C.; Hepler, Ernest M.; and Holmstrand, Paul. Apparatus for wrapping conduit with sheet material. 4,426,834, Cl. 57-10.000.
Dollenmayer, William L., to International Business Machines Corporation. Printwheel detent. 4,427,312, Cl. 400-144.200.
Donn Incorporated: *See*—
Swensen, Eugene L., 4,426,824, Cl. 52-794.000.
Doose, Paul R. Construction for three dimensional logical toy. 4,427,197, Cl. 273-153.00S.
Dorey, Howard A.: *See*—
Skinner, Michael J.; Woollven, Jack; Metcalf, Eric; and Dorey, Howard A., 4,428,061, Cl. 364-728.000.
Dorrestijn, Antoon; Lemstra, Pieter J.; and Van Unen, Lambert H. T., to Stamicarbon B.V. Rigid polyvinyl chloride foam. 4,427,795, Cl. 521-134.000.
Dotson, Billy J., to Mobil Oil Corporation. In-situ uranium leaching. 4,427,236, Cl. 299-5.000.
Dow Chemical Company, The: *See*—
Ehr, Robert J., 4,427,695, Cl. 424-288.000.
Lau, Philip Y., 4,427,517, Cl. 204-197.000.
McEwen, Gerald K.; and Thomas, Lowell S., 4,427,813, Cl. 524-119.000.
Quick, Joe A., Jr., 4,427,548, Cl. 210-617.000.
Tung, Lu H.; and Y-s. Lo, Grace, 4,427,837, Cl. 525-314.000.
Wessling, Ritchie A.; and Pickelman, Dale M., 4,427,819, Cl. 524-458.000.
Dow Corning Corporation: *See*—
Elias, Michael G.; and Freiberg, Alan L., 4,427,811, Cl. 524-96.000.
Sweet, Randall P., 4,427,801, Cl. 523-212.000.
Dragerwerk Aktiengesellschaft: *See*—
Hahn, Rainer, 4,427,635, Cl. 422-113.000.
Dresser Industries, Inc.: *See*—
Crawford, Micheal B., 4,427,081, Cl. 175-376.000.
Stachowicz, Robert W., 4,426,848, Cl. 60-605.000.
Dresser, Thorpe: *See*—
Plys, Albert G.; Dresser, Thorpe; Ohlswager, Stanley; and Peterman, Lee G., 4,427,305, Cl. 374-45.000.
Drexelbrook Controls, Inc.: *See*—
Maltby, Frederick L.; Loewenstern, Kenneth M.; and Benning, Jack G., Jr., 4,428,026, Cl. 361-280.000.
Dross, Joachim: *See*—
Reinehr, Ulrich; Dross, Joachim; Herbertz, Toni; Jungverdorben, Hermann-Josef; and Burghartz, Hans K., 4,427,613, Cl. 264-206.000.
Drushel, Robert W.; and Bercaw, Raymond, to Ex-Cell-O Corporation. Electric discharge machine current cutoff control. 4,427,871, Cl. 219-69.00P.
Dubini, Uberto, to S.p.A. Valvole Aerosol Research Italiana -V.A.R.I. Metering valve for dispensing pressurized liquids. 4,427,137, Cl. 222-402.200.
DuBosque, Clayton, Jr., to Thermatool Corp. Solar collector unit for roof or wall mounting. 4,426,998, Cl. 126-448.000.
Ducati Elettrotecnica S.p.A.: *See*—
Zanvettor, Sergio, 4,427,806, Cl. 523-460.000.
Duchesne, Gonzague L.; and Perrault, Guy, to Canada, Her Majesty the Queen in right of. Curable propellant binding systems with bonding agent combination. 4,427,468, Cl. 149-19.900.
Duke, Jack R.: *See*—
Chari, Venu; Duke, Jack R.; and Gersten, Shimon, 4,428,046, Cl. 364-200.000.
Duke University: *See*—
Bonaventura, Joseph; and Bonaventura, Celia, 4,427,416, Cl. 23-293.00R.
Dunkl, Franz S.: *See*—
Ross, Sidney D.; and Dunkl, Franz S., 4,428,028, Cl. 361-433.000.
Duonghong, Dung: *See*—
Graetzel, Michael; Kalyanasundaram, Kuppuswamy; Duonghong, Dung; Neumann-Spallart, Michael; and Borgarello, Enrico, 4,427,749, Cl. 429-111.000.
Dupin, Thierry, to Rhone-Poulenc Specialites Chimques. Catalyst for oxidation of hydrogen sulfide and/or organosulfur compounds to SO_2 and process for preparing the catalyst. 4,427,576, Cl. 502-218.000.
Du Pont de Nemours, E. I., and Company: *See*—
Baloga, Michael R., 4,427,451, Cl. 106-300.000.
Charles, Magalie M., 4,427,761, Cl. 430-291.000.
Fahy, Edward J.; and Steichen, John C., 4,427,298, Cl. 366-132.000.
Gorondy, Emery J., 4,427,412, Cl. 8-471.000.
Gruetzmacher, Robert R.; and Munger, Stanley H., 4,427,759, Cl. 430-273.000.
Haber, Stephen B., 4,427,693, Cl. 424-275.000.
Quinn, John A., 4,427,758, Cl. 430-271.000.
Yunan, Malak E., 4,426,933, Cl. 102-275.300.
Dupraz, Jean-Pierre: *See*—
Aumont, Pierre; and Dupraz, Jean-Pierre, 4,427,900, Cl. 307-149.000.
Duran, Reginald F.; and Brass, Jack. Heat treatment fixture. 4,427,379, Cl. 432-261.000.
Dutt, Bulusu V., to Bell Telephone Laboratories, Incorporated. Liquid phase epitaxy. 4,427,464, Cl. 148-171.000.
Duvall, William S.; and English, William K., to Xerox Corporation. Data processing system with multiple display apparatus. 4,428,065, Cl. 364-900.000.
Duveau, Jean. Solids separation and liquid clarification system. 4,427,551, Cl. 210-741.000.
Duvet, Claude; and Iato, Michel, to Societe Nationale Elf Aquitaine (Production). Pressure conduit connecting device. 4,427,218, Cl. 285-184.000.
Dyar, Harrison G. Thermal insulating system particularly adapted for building construction. 4,426,819, Cl. 52-407.000.
Dyckerhoff & Widmann Aktiengesellschaft: *See*—
Bomhard, Helmut, 4,426,817, Cl. 52-262.000.
Dykema, Owen W., to Rockwell International Corporation. Combustion method. 4,427,362, Cl. 431-4.000.
E. M. D'Hooge N.V.: *See*—
Vanderheijden, Herman E. C., 4,426,794, Cl. 34-109.000.
E. R. Squibb & Sons, Inc.: *See*—
Cilento, Rudolfo D.; Riffkin, Charles; and LaVia, Anthony L., 4,427,737, Cl. 428-315.700.
Karanewsky, Donald S.; and Petrillo, Edward W., Jr., 4,427,665, Cl. 424-200.000.
Varma, Ravi K.; and Karanewsky, Donald S., 4,427,592, Cl. 260-397.450.
Eastern Company, The: *See*—
Wolniak, Stanley C.; Kincaid, Herbert; Spencer, Elbert M.; and Brown, Ronald L., 4,427,852, Cl. 200-44.000.
Eastin, John A. Manufacturing and using nitrogen fertilizer solutions on a farm. 4,427,434, Cl. 71-54.000.
Eastman Kodak Company: *See*—
Day, Pierce B., 4,427,291, Cl. 355-46.000.
Edwards, Ray, 4,427,833, Cl. 525-240.000.
Gasper, John, 4,427,283, Cl. 355-1.000.
Ebauches Electroniques S.A.: *See*—
Cleusix, Willy, 4,427,301, Cl. 368-72.000.
Ebeling, Franklin D. Loader for a vehicle body. 4,427,333, Cl. 414-409.000.
Eberle, William J.: *See*—
Oxenreider, Terry; and Eberle, William J., 4,427,617, Cl. 264-296.000.
Echte, Adolf; Gausepohl, Hermann; Hofmann, Hermann P.; and Mittnacht, Hans, to BASF Aktiengesellschaft. Process for the continuous preparation of rubber-modified polymers of vinylaromatics. 4,427,826, Cl. 525-53.000.
Eckardt, Bernd: *See*—
Queiser, Horst; and Eckardt, Bernd, 4,427,893, Cl. 250-506.100.
Eckardt, Rudolf; and Neuendorf, Hans-Cristoph, to Flachglass Aktiengesellschaft. Method of and apparatus for grinding the edges of glass sheets. 4,426,811, Cl. 51-101.00R.
Eckert, Robert C., to International Paper Company. Delignification and bleaching process for lignocellulosic pulp with peroxide in the presence of metal additives. 4,427,490, Cl. 162-78.000.
Economics Laboratory, Inc.: *See*—
Rowan, Henry A., 4,427,456, Cl. 134-25.100.
Economy Engineering Company: *See*—
Wehmeyer, Donald T.; and Barnhart, Ronald W., 4,427,093, Cl. 182-141.000.
Edelstein, Alan; and White, Allan M., to Micro Graphic Concepts Inc. Camera device for including separate information area on photographs. 4,427,279, Cl. 354-107.000.

Edson, Michael E.: *See*—
Cardoza, Albert C.; Dawley, Von M.; Diaz, Edgardo C.; Edson, Michael E.; Nelson, Jerry J.; Peters, Robert D.; Wear, Dennis R.; and Wier, Daniel H., 4,428,037, Cl. 362-250.000.

Edwards, Ray, to Eastman Kodak Company. Polyethylene extrusion coating compositions. 4,427,833, Cl. 525-240.000.

Ege, Sigmund, to International Standard Electric Corporation. Bending strain relief with adjustable stiffness. 4,427,033, Cl. 138-103.000.

Eggertsberger, Robert: *See*—
Niethhammer, Dieter; Eggertsberger, Robert; and Wilmers, Gerhard, 4,428,042, Cl. 364-200.000.

Ehata, Shigeru: *See*—
Mizushima, Masashi; Ehata, Shigeru; Maruyama, Masanori; and Fukushima, Masakazu, 4,427,917, Cl. 313-389.000.

Eheim, Franz, to Robert Bosch GmbH. Overspeed safety means for fuel injection pumps of internal combustion engines. 4,426,969, Cl. 123-357.000.

Ehr, Robert J., to Dow Chemical Company, The. Compositions of asymmetric diphenyl organotins and use for control of plant diseases. 4,427,695, Cl. 424-288.000.

Ehrmann, Peter: *See*—
Holzer, Helmut; and Ehrmann, Peter, 4,427,205, Cl. 277-134.000.

Eichler, Horst. Side propellers for the propulsion of fast boats and aircraft. 4,427,341, Cl. 416-142.000.

Eisbrecher, Hans-Dieter; and Ruppert, Helmut, to Thyssen Industrie Aktiengesellschaft. Device for coupling and uncoupling two parts movable relative to each other using a length-variable guide rod. 4,427,398, Cl. 464-26.000.

Eisele, Hermann; Stumpp, Gerhard; Wessel, Wolf; Flaig, Ulrich; and Piwonka, Fridolin, to Robert Bosch GmbH. Correction device for a fuel metering system in an internal combustion engine. 4,426,980, Cl. 123-478.000.

Eisschun, Charles D., to Micro-Plate, Inc. Chemical process apparatus. 4,427,019, Cl. 134-72.000.

Ejchler, Henry: *See*—
Comer, Glen S., Jr.; and Ejchler, Henry, 4,427,026, Cl. 137-556.000.

Electric Power Research Institute, Inc.: *See*—
Flick, Carl; and Nathenson, Richard D., 4,427,907, Cl. 310-52.000.

Electrolocation Limited: *See*—
Sole, Lloyd H., 4,427,942, Cl. 324-326.000.

Eley, Edgar R., to Westinghouse Electric Corp. Oil-insulated switch. 4,427,860, Cl. 200-150.00G.

El-Hag, Nabil A., to General Foods Corporation. Method for heating par-fried, batter-coated frozen foods. 4,427,706, Cl. 426-243.000.

Elias, Michael G.; and Freiberg, Alan L., to Dow Corning Corporation. Silicone elastomeric emulsion having improved shelf life. 4,427,811, Cl. 524-96.000.

Elliott, Lloyd E., Jr.; and Hudson, John L., to Texaco Inc. Fail-safe circuit mechanism for generating a pulse indicating the precise moment of firing of a gas exhausting gun. 4,427,091, Cl. 181-120.000.

Ellis, Ralph J.; Gurtler, Richard W.; and Sarma, Kalluri R., to Motorola, Inc. Apparatus for semiconductor ribbon-to-ribbon conversion. 4,427,638, Cl. 422-250.000.

Elson, John P., to Copeland Corporation. Refrigeration compressor suspension system. 4,427,349, Cl. 417-363.000.

Emerson Electric Co.: *See*—
Mitchell, Richard L.; Brundage, Richard B.; and Palmer, John A., 4,427,042, Cl. 144-1.00R.
Wang, David C.; and Voepel, Harry W., 4,426,771, Cl. 29-596.000.

Emhart Industries, Inc.: *See*—
Bergen, Gary R., 4,427,224, Cl. 292-169.230.

Emi, Toshihiko: *See*—
Sumida, Norio; Oguchi, Yukio; Fujii, Tetsuya; Emi, Toshihiko; Fujimura, Toshio; Ueda, Arata; and Orito, Kenichi, 4,427,444, Cl. 75-93.00R.

EMPAC AG: *See*—
Riederer, Hans G., 4,427,020, Cl. 134-127.000.

Empress Cubana Importadora de Materias Primasy Productos: *See*—
Gonzalez, Miguel M., 4,427,465, Cl. 149-2.000.

Enders, George E.: *See*—
Shichman, Daniel; and Enders, George E., 4,427,473, Cl. 156-130.000.

Endo, Satoru; and Yamauchi, Masaaki, to Hitachi, Ltd. Method for forming electron gun electrodes. 4,427,397, Cl. 445-49.000.

Eng, Sverre T. Method and apparatus for optical fiber communication operating at gigabits per second. 4,427,895, Cl. 250-551.000.

Engel, Joseph C.; and Mercier, Bernard J., to Westinghouse Electric Corp. Circuit interrupter with digital trip unit and automatic reset. 4,428,022, Cl. 361-96.000.

Engelhard Corporation: *See*—
Bartholic, David B., 4,427,538, Cl. 208-127.000.
Kostansek, Edward C., 4,427,450, Cl. 106-288.00B.

England, Richard; Bowcott, John E. L.; Olds, John S.; and Jobling, Alan, to Lensfield Products Limited. Protein production. 4,427,583, Cl. 260-123.700.

English Clays Lovering Pochin & Company Limited: *See*—
Jeffs, David G., 4,427,452, Cl. 106-308.00Q.

English Electric Valve Company Limited: *See*—
King, David R., 4,428,025, Cl. 361-274.000.

English, William K.: *See*—
Duvall, William S.; and English, William K., 4,428,065, Cl. 364-900.000.

Epson Corporation: *See*—
Fujiwara, Hitoshi; and Kodaira, Kozo, 4,427,314, Cl. 400-338.200.

Epstein, Eugene G., to Epstein Marketing Corp. Steaming apparatus. 4,426,857, Cl. 68-222.000.

Epstein Marketing Corp.: *See*—
Epstein, Eugene G., 4,426,857, Cl. 68-222.000.

Ernst Leitz Wetzlar GmbH: *See*—
Kraft, Winfried; Froboese, Walter; Reinheimer, Guenter; and Wieber, Karl, 4,427,270, Cl. 350-507.000.

Eronini, Iheanyichukwu E. Hair braider. 4,427,017, Cl. 132-9.000.

Eror, Nicholas G.: *See*—
Carlson, F. Paul; Blakemore, John S.; and Eror, Nicholas G., 4,427,457, Cl. 148-1.500.

Erwel Inc.: *See*—
Adachi, Rai R., 4,427,149, Cl. 236-59.000.

Escue, Jesse W. Sealing assembly for rotatable shafts. 4,427,203, Cl. 277-81.00R.

Eskesen, Peder C., to Brdr. Eskesen Aktieselskab. Method of making injection moulded plastic objects with imbedded decorative and/or descriptive prints. 4,427,615, Cl. 264-261.000.

Esko Poltto Oy: *See*—
Levaaho, Veikko; and Poltto, Esko K., 4,427,212, Cl. 280-511.000.

Esmil BV: *See*—
Klaren, Dick G., 4,427,053, Cl. 165-1.000.

Estel Hoogovens B.V.: *See*—
Buhrmann, Gerardus P., 4,427,186, Cl. 266-225.000.

Esterberg, Warren E.: *See*—
Copie, Fernand; Esterberg, Warren E.; Fadness, Quentin K.; Stewart, Howard A.; and Ringwelski, Robert J., 4,427,334, Cl. 414-710.000.

Ethicon, Inc.: *See*—
Roshdy, Constance E., 4,427,109, Cl. 206-63.300.
Transue, James A., 4,427,008, Cl. 128-325.000.

Ethyl Products Company: *See*—
Ostrowsky, Efrem M., 4,427,126, Cl. 215-307.000.

Etnyre, Robert E.; and Wylie, William H., to Wylie Manufacturing Company. Apparatus for heating aggregate, recycled asphalt and the like. 4,427,376, Cl. 432-105.000.

Etude et Developpement en Metallurgie: *See*—
Merrien, Pierre L.; and Merrien, Pierre A., 4,427,443, Cl. 75-68.00R.

Euroceltique, S.A.: *See*—
Bunting, Thomas G.; Centrone, Dominic A.; Sackler, Richard S.; and Halpern, Alfred, 4,427,631, Cl. 422-22.000.

Evans, Joseph H.; Hatman, Jeffrey J.; and Clark, William E., to Ramada Energy Systems, Inc. Solar energy collector. 4,426,999, Cl. 126-450.000.

Evans, Maurice L.: *See*—
Mola, Clark M.; Evans, Maurice L.; and Beringer, Richard D., 4,426,747, Cl. 15-21.00D.

Everett/Charles Test Equipment, Inc.: *See*—
Hines, Clyde K.; and Fettig, Lyle, 4,427,250, Cl. 339-75.00M.

Ex-Cell-O Corporation: *See*—
Drushel, Robert W.; and Bercaw, Raymond, 4,427,871, Cl. 219-69.00P.

Exner, Klaus: *See*—
Steinmetz, Alfred; Exner, Klaus; and Welters, Dieter, 4,426,865, Cl. 72-44.000.

Exxon Production Research Co.: *See*—
Steiger, Ronald P., 4,427,080, Cl. 175-325.000.
Stone, Herbert L., 4,427,067, Cl. 166-274.000.

Exxon Research & Engineering Co.: *See*—
Brownawell, Darrell W.; Gutierrez, Antonio; Matthews, Patricia C.; and Walker, Thad O., 4,427,564, Cl. 252-8.55R.
Dickakian, Ghazi, 4,427,530, Cl. 208-22.000.
Dickakian, Ghazi, 4,427,531, Cl. 208-40.000.
Koetsier, Wicher T., 4,427,577, Cl. 252-455.00Z.
Peiffer, Dennis G.; Lundberg, Robert D.; and Walker, Thad O., 4,427,812, Cl. 524-115.000.
Ramanarayahan, Trikur A.; Petkovic-Luton, Ruzica; and Ayer, Raghavan, 4,427,447, Cl. 75-252.000.
Swan, George A., 4,427,533, Cl. 208-65.000.

Eyelet Specialty Co., Inc.: *See*—
Marshall, Francis G.; and Klimeck, Edward F., 4,427,124, Cl. 215-216.000.

EZY Wrap Products Pty. Limited: *See*—
Macgrory, Wallace J.; and Frederick, George C., 4,427,144, Cl. 225-7.000.

F. M. Howell & Company: *See*—
Howell, George L.; and Lambrix, Gregg F., 4,427,114, Cl. 206-328.000.

Fabrig, Paul, to Womako Maschinenkonstruktionen GmbH. Apparatus for producing helical wire coils. 4,426,871, Cl. 72-141.000.

Facchini, Libero, to Farmatic S.r.l. Capsule orienting device, particularly for capsule-filling or processing machines. 4,427,131, Cl. 221-173.000.

Facet Enterprises, Inc.: *See*—
Crisp, Robert L., Jr., 4,426,952, Cl. 116-267.000.

Facoetti, Hugues: *See*—
Broussoux, Dominique; Facoetti, Hugues; and Micheron, Francois, 4,427,609, Cl. 264-22.000.

Fadness, Quentin K.: *See*—
Copie, Fernand; Esterberg, Warren E.; Fadness, Quentin K.; Stewart, Howard A.; and Ringwelski, Robert J., 4,427,334, Cl. 414-710.000.

Fahy, Edward J.; and Steichen, John C., to Du Pont de Nemours, E. I., and Company. Method and system for accurately providing fluid blends. 4,427,298, Cl. 366-132.000.

Faith, Donald L. Target scoring system. 4,427,199, Cl. 273-371.000.

Fallier, Charles N., Jr.: *See*—
Proud, Joseph M.; Smith, Robert K.; and Fallier, Charles N., Jr., 4,427,920, Cl. 315-248.000.
Proud, Joseph M.; Smith, Robert K.; and Fallier, Charles N., Jr., 4,427,925, Cl. 315-248.000.

Farag, Samir F.: *See*—
Kleinecke, John D.; Farag, Samir F.; and Little, Thomas R., 4,427,854, Cl. 200-50.0AA.

Farmatic S.r.l.: *See*—
Facchini, Libero, 4,427,131, Cl. 221-173.000.

Farmer, Robert M.; and Faucher, Brian R., to Litton Industrial Products, Inc. Radial infeed thread roll attachment. 4,426,869, Cl. 72-104.000.

Fassio, Felice, to Fiat Auto S.p.A. Monostable switch device for controlling the rear window washer/wiper of an automobile. 4,427,850, Cl. 200-6.00R.

Fata European Group S.p.A.: *See*—
Di Rosa, Gaetano, 4,427,375, Cl. 432-58.000.

Faucher, Brian R.: *See*—
Farmer, Robert M.; and Faucher, Brian R., 4,426,869, Cl. 72-104.000.

Faust, Wolfgang; Nickol, Friedrich W.; and Baeger, Holm, to VDO Adolf Schindling AG. Method for the production of conductor tracks applied to a support. 4,426,775, Cl. 29-846.000.

Fawkes, John S., to Ampex Corporation. Electronic switching circuit for use in magnetic head drives. 4,428,008, Cl. 360-61.000.

Fehr, Werner; Ohlin, Claes; and Schabrun, Bruno, to BBC Brown, Boveri & Company, Limited. Grounding switch. 4,427,858, Cl. 200-146.00R.

Feinerman, Alan D.; Grimes, Donald L.; and Messina, Kathy J., to Polaroid Corporation. Microcomputer controlled photographic exposure system and method. 4,427,276, Cl. 354-412.000.

Felix, Raymond A., to Stauffer Chemical Company. Method for preparation of N-phosphonomethylglycine. 4,427,599, Cl. 260-502.50F.

Felter, Mark R. Apparatus to be towed through the water. 4,427,394, Cl. 441-66.000.

Fennell, Robert D.; Weidler, Allen J.; and Bailey, David F., to Motorola, Inc. Encoder for transmitted message activation code. 4,427,980, Cl. 340-825.520.

Fennimore, Jack; Potter, William D.; and Kiamil, Sinan B., to Smith & Nephew Associated Companies Ltd. Bandages. 4,427,003, Cl. 128-90.000.

Fettig, Lyle: *See*—
Hines, Clyde K.; and Fettig, Lyle, 4,427,250, Cl. 339-75.00M.

Feuerstein, Diane: *See*—
Snyder, William R.; and Feuerstein, Diane, 4,427,568, Cl. 252-180.000.

Fiat Auto S.p.A.: *See*—
Fassio, Felice, 4,427,850, Cl. 200-6.00R.
Recluta, Franco, 4,427,849, Cl. 200-6.00R.

Fiber Industries, Inc.: *See*—
Conrad, Peter, 4,427,158, Cl. 242-35.50A.

Fichot, Julie Y.; and Roesch, Alfred, to General Electric Company. Thermal stress relieving bimetallic plate. 4,427,993, Cl. 357-81.000.

Fields, Ellis K.; and Anderson, Ronald L., to Standard Oil Company (Indiana). Class of rust inhibitors for fuels and oils. 4,427,565, Cl. 252-56.00D.

Fields, Max H. Artillery training aid. 4,427,386, Cl. 434-19.000.

Figone, Frank M., to Westinghouse Electric Corp. Quick release girth band. 4,426,755, Cl. 24-28.000.

Figura, Ilona W.: *See*—
Nudel, Ron; Janauer, Gilbert E.; Schrier, Eugene E.; and Figura, Ilona W., 4,427,796, Cl. 521-139.000.

Fink, Heiner: *See*—
Kahlert, Peter; Schone, Helmut; Johne, Hans; Jentzsch, Arndt; Hefftler, Victor; Kuhnert, Werner; Karl, Rainer; Dittmann, Norbert; Fink, Heiner; and Preussger, Karl-Heinz, 4,427,193, Cl. 271-277.000.

Finsterwald, P. Michael; and Kopel, LeRoy, to Advanced Diagnostic Research Corporation. Ultrasonic scanner. 4,426,886, Cl. 73-633.000.

Firestone Tire & Rubber Company, The: *See*—
Balbis, Manuel G.; and King, Colin V., 4,427,046, Cl. 152-209.00R.
Hergenrother, William L.; Matlock, Mark G.; and Ambrose, Richard J., 4,427,828, Cl. 525-66.000.
Hogan, James E.; and Camplair, George M., 4,426,901, Cl. 83-861.000.
Rumpf, Robert J., 4,427,164, Cl. 242-107.40R.

Fischer, Friederich: *See*—
Oellers, Walter; and Fischer, Friederich, 4,426,753, Cl. 19-83.000.

Fischer, Victor H., to Thermal Systems Limited. Reciprocating heat engine. 4,426,847, Cl. 60-514.000.

Fischer, Winfried: *See*—
Alberts, Heinrich; Fischer, Winfried; and Leuschke, Christian, 4,427,809, Cl. 524-37.000.

Fitzgibbon, Jeremiah J., to Kennecott Corporation. Sintered spherical pellets containing clay as a major component useful for gas and oil well proppants. 4,427,068, Cl. 166-280.000.

Fives-Cail Babcock: *See*—
Dambrine, Francis; and Ghestem, Gerard, 4,427,377, Cl. 432-106.000.

Fjeldsted, Thomas P., to Rockwell International Corporation. Selectable field-of-view infrared lens. 4,427,259, Cl. 350-1.300.

Flachglass Aktiengesellschaft: *See*—
Eckardt, Rudolf; and Neuendorf, Hans-Cristoph, 4,426,811, Cl. 51-101.00R.

Flaig, Ulrich: *See*—
Eisele, Hermann; Stumpp, Gerhard; Wessel, Wolf; Flaig, Ulrich; and Piwonka, Fridolin, 4,426,980, Cl. 123-478.000.

Flakt Aktiebolag: *See*—
Fulton, Robert, 4,426,917, Cl. 98-38.00B.

Flanagan, Joseph E.; and Wilson, Edgar R., to Rockwell International Corporation. Advanced monopropellants. 4,427,466, Cl. 149-92.000.

Fleming, Robert J. Electric steam radiator space heating unit. 4,427,875, Cl. 219-341.000.

Flick, Carl; and Nathenson, Richard D., to Electric Power Research Institute, Inc. Spiral pancake armature winding module for a dynamoelectric machine. 4,427,907, Cl. 310-52.000.

Floyd, Herbert R. Anti-theft auto lock. 4,426,859, Cl. 70-18.000.

Flying K Equipment System, Inc.: *See*—
Kofahl, William M., 4,427,348, Cl. 417-342.000.

FMC Corporation: *See*—
Peterson, John G., 4,427,089, Cl. 180-253.000.

Fogg, C. Davis, to Bausch & Lomb Incorporated. Gaskets for thin glass lenses mounted in ophthalmic frames. 4,427,271, Cl. 351-154.000.

Fong, Dodd W.; and Allain, Ronald J., to Nalco Chemical Company. Hydrogenation of residual monomers in partially polymerized acrylamide copolymers in latex form. 4,427,821, Cl. 524-555.000.

Ford Aerospace & Communications Corporation: *See*—
Buchtel, Michael E.; and Honda, Ronald T., 4,427,878, Cl. 250-203.00R.

Ford, Spencer K.: *See*—
Wells, Edward S.; Ford, Spencer K.; Werner, Jack E.; and Lindsay, Erin J., 4,427,009, Cl. 128-400.000.

Fore, Sharon R., to Phillips Petroleum Company. Removal of solids from a cooling tower basin. 4,427,553, Cl. 210-743.000.

Form & Stake Lifts, Inc.: *See*—
Marik, Victor F., 4,427,182, Cl. 254-131.000.

Forney, Victor D., to Frost, Eugene A. Apparatus for adjusting simultaneously fluid pressure in a plurality of pressure vessels. 4,427,022, Cl. 137-224.000.

Fosdick, George. Efficient wind turbine design for low velocity air flow. 4,427,343, Cl. 416-200.00A.

Foster, John R.: *See*—
Godec, Maksimilijan; Foster, John R.; Straub, Paul J.; and Mahler, Allan K., 4,427,223, Cl. 292-92.000.

Foster, Leslie W., to Toro Company, The. Line metering apparatus. 4,426,780, Cl. 30-276.000.

Fourcade, Pierre, to Thomson-CSF. Data time compression device and decompression device. 4,428,063, Cl. 364-900.000.

Fowler, David P., to Frito-Lay, Inc. Method and apparatus for generating high pH limewater. 4,427,643, Cl. 423-580.000.

Fowler, Michael C.; and Smith, David C., to United Technologies Corporation. CO_2 Coupling material. 4,426,843, Cl. 60-203.100.

Franck, Heinz-Gerhard: *See*—
Stadelhofer, Jurgen; Franck, Heinz-Gerhard; and Kohler, Helmut, 4,427,526, Cl. 208-8.0LE.

Frank, James P., to General Electric Company. Method of assembling a switch and terminal assembly and mounting it to a dynamoelectric machine. 4,426,770, Cl. 29-596.000.

Frankpitt, Gerald M.: *See*—
Brain, David M.; and Frankpitt, Gerald M., 4,426,940, Cl. 111-7.000.

Fransson, George E.; Johnson, Stuart J.; and Haug, Edward W., to Barber-Colman Company. Method of shape generation by orbiting a rotating hob. 4,427,324, Cl. 409-12.000.

Frass, Werner: *See*—
Mohr, Dieter; and Frass, Werner, 4,427,765, Cl. 430-525.000.

Frederick, George C.: *See*—
Macgrory, Wallace J.; and Frederick, George C., 4,427,144, Cl. 225-7.000.

Frederiksen, Jørgen O. Mounting bracket for use in installing beam-like channel members under horizontal surfaces, in particular ceilings. 4,427,171, Cl. 248-68.00R.

Fredriksen, Nils; and Wecker, Heinrich, to Claas OHG. Agricultural machine with dispiaceable cabin. 4,427,090, Cl. 180-327.000.

Freermann, Johannes, to Carl Schmale KG. Pile-gap sensor, especially for deep-pile carpet. 4,427,855, Cl. 200-61.130.

Freiberg, Alan L.: *See*—
Elias, Michael G.; and Freiberg, Alan L., 4,427,811, Cl. 524-96.000.

Freiberg, Leslie A.: *See*—
Tadanier, John S.; Hallas, Robert; Freiberg, Leslie A.; and Baciuo, David J., 4,427,662, Cl. 424-180.000.

Frenken, Hans; Friedsam, Josef; and Voss, Karl, to AGFA-Gevaert Aktiengesellschaft. Process for the preparation of solutions from environmentally noxious substances. 4,427,645, Cl. 423-658.500.

Frenken, Hans: *See*—
Hourticolon, Roland; Roth, Gerhard; Frenken, Hans; Schaffer, Helmut; and Koepke, Gunther, 4,426,757, Cl. 29-121.800.

Frey, William L. Coupling. 4,426,892, Cl. 74-785.000.

Friberg, Nelson, to Owens-Illinois, Inc. Registration control method for a label cutoff apparatus. 4,426,898, Cl. 83-37.000.

Frick, Charles E.; Skidmore, Archie F.; and Williams, Isaac E., to Union Carbide Corporation. Automatic tape filter. 4,427,543, Cl. 210-143.000.

Friebe, Walter-Gunar; Winter, Werner; Thiel, Max; Roesch, Androniki; and Wilhelms, Otto-Henning, to Boehringer Mannheim GmbH. 1,2-Dihydroquinolines connected via an oxyalkyl group with a piperidine ring and having anti-allergic action. 4,427,680, Cl. 424-258.000.

Fried. Krupp Gesellschaft mit beschrankter Haftung: *See*—
Spies, Klaus, 4,427,463, Cl. 148-129.000.

Friedman, Robert H., to Getty Oil Company. Sand consolidation methods. 4,427,069, Cl. 166-295.000.
Friedmann & Maier Aktiengesellschaft: *See*—
Lehner, Gerhard; and Stipek, Theodor, 4,426,982, Cl. 123-501.000.
Friedmann, Oswald: *See*—
Maucher, Paul; Friedmann, Oswald; and Jackel, Johann, 4,426,915, Cl. 92-29.000.
Maucher, Paul; and Friedmann, Oswald, 4,427,101, Cl. 192-48.700.
Friedsam, Josef: *See*—
Frenken, Hans; Friedsam, Josef; and Voss, Karl, 4,427,645, Cl. 423-658.500.
Frit Industries, Inc.: *See*—
Moore, William P., 4,427,719, Cl. 427-205.000.
Frito-Lay, Inc.: *See*—
Fowler, David P., 4,427,643, Cl. 423-580.000.
Froboese, Walter: *See*—
Kraft, Winfried; Froboese, Walter; Reinheimer, Guenter; and Wieber, Karl, 4,427,270, Cl. 350-507.000.
Frohberger, Paul-Ernst: *See*—
Kraatz, Udo; Stetter, Jorg; Buchel, Karl H.; Frohberger, Paul-Ernst; and Brandes, Wilhelm, 4,427,672, Cl. 424-245.000.
Kramer, Wolfgang; Buchel, Karl H.; Brandes, Wilhelm; and Frohberger, Paul-Ernst, 4,427,673, Cl. 424-245.000.
Frost, Eugene A.: *See*—
Forney, Victor D., 4,427,022, Cl. 137-224.000.
Fryer, Rodney I.; Trybulski, Eugene J.; and Walser, Armin, to Hoffmann-La Roche Inc. Pyrimido[4,5-d][2]benzazepines. 4,427,589, Cl. 260-243.300.
Fuchs, Paul-Wilhelm: *See*—
Doetsch, Werner; Dillenburg, Helmut; Fuchs, Paul-Wilhelm; and Honig, Helmut, 4,427,644, Cl. 423-582.000.
Fuji Photo Film Co., Ltd.: *See*—
Aoki, Kozo; and Seoka, Yoshio, 4,427,767, Cl. 430-552.000.
Fujiyama, Masaaki; and Yamaguchi, Nobutaka, 4,427,738, Cl. 428-323.000.
Kitatani, Katuji; Sera, Hidefumi; Arai, Atsuaki; Ogawa, Masasi; Ishigaki, Kunio; and Ogura, Haruo, 4,427,768, Cl. 430-623.000.
Oishi, Kengo; Moriwaki, Masayoshi; and Komiyama, Choji, 4,427,166, Cl. 242-199.000.
Fuji Xerox Co., Ltd.: *See*—
Iyoda, Tetsuo; and Tamai, Masayoshi, 4,427,986, Cl. 346-1.100.
Kikuchi, Yoshiki; and Ohmori, Takashi, 4,427,985, Cl. 346-1.100.
Kikuchi, Yoshiki, 4,427,987, Cl. 346-74.400.
Takahashi, Toshikatsu, 4,427,909, Cl. 310-74.000.
Fujii, Hideaki: *See*—
Ohgawara, Yoshiaki; and Fujii, Hideaki, 4,428,006, Cl. 360-33.000.
Fujii, Tetsuya: *See*—
Sumida, Norio; Oguchi, Yukio; Fujii, Tetsuya; Emi, Toshihiko; Fujimura, Toshio; Ueda, Arata; and Orito, Kenichi, 4,427,444, Cl. 75-93.00R.
Fujimori, Noboru: *See*—
Tachibana, Noriki; Kobayashi, Morio; and Fujimori, Noboru, 4,427,764, Cl. 430-523.000.
Fujimura, Naoto; Tanaka, Takashi; Fujita, Takeshi; Matsumoto, Masakazu; Takebayashi, Norie; Takasu, Yoshio; and Ishikawa, Shozo, to Canon Kabushiki Kaisha. Electrophotographic photosensitive member with disazo or trisazo compound. 4,427,753, Cl. 430-58.000.
Fujimura, Toshio: *See*—
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Fujino, Masahisa; Sunouchi, Akio; Suzuki, Nobuyuki; and Suzuki, Ryuji, to Canon Kabushiki Kaisha. Mode change over device for camera. 4,427,282, Cl. 354-271.100.
Fujisawa, Nobuhiko; and Matsui, Yoshiki, to Ryobi Ltd. Numbering device for use in offset printing machine. 4,426,929, Cl. 101-76.000.
Fujisawa Pharmaceutical Co., Ltd.: *See*—
Miyazaki, Yoshio; Nakaguchi, Osamu; and Hashimoto, Masashi, 4,427,581, Cl. 260-112.50R.
Takaya, Takao; Takasugi, Hisashi; Tsuji, Kiyoshi; and Chiba, Toshiyuki, 4,427,674, Cl. 424-246.000.
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Fujita, Takeshi: *See*—
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Fujita, Teizo, to Izumi Denki Corporation. Small-sized relay and method for fabricating the same. 4,427,863, Cl. 200-306.000.
Fujitsu Limited: *See*—
Baba, Fumio, 4,428,068, Cl. 365-200.000.
Yamamura, Shigeyuki; Kosemura, Kinjiro; Shima, Takao; and Hidaka, Norio, 4,427,991, Cl. 357-74.000.
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Fujiwara, Toshitaka: *See*—
Nishimura, Masao; Nabeta, Teiichi; and Fujiwara, Toshitaka, 4,426,852, Cl. 62-179.000.
Fujiyama, Mamoru: *See*—
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Fujiyama, Masaaki; and Yamaguchi, Nobutaka, to Fuji Photo Film Co., Ltd. Magnetic recording medium. 4,427,738, Cl. 428-323.000.
Fukahori, Hidehiko: *See*—
Iwashita, Tomonori; Mashimo, Yukio; Fukahori, Hidehiko; and Watanabe, Yoshitaka, 4,427,280, Cl. 354-173.110.
Fukui, Shoshin; Shinjo, Masayoshi; and Aoyama, Hirokazu, to Daikin Kogyo Co., Ltd. Mold release composition. 4,427,803, Cl. 523-402.000.
Fukuoka, Shigenori; Tsutsui, Sadaharu; and Matsumaru, Toshio, to Sumitomo Heavy Industries, Ltd. Injection stretch-blow molding machine. 4,427,359, Cl. 425-525.000.
Fukushima, Masakazu: *See*—
Mizushima, Masashi; Ehata, Shigeru; Maruyama, Masanori; and Fukushima, Masakazu, 4,427,917, Cl. 313-389.000.
Fulton, Robert, to Flakt Aktiebolag. Method of and apparatus for conditioning the atmosphere of a space. 4,426,917, Cl. 98-38.00B.
Furst, Raymond B., to Rockwell International Corporation. Thrust control vanes for waterjets. 4,427,338, Cl. 415-210.000.
Furukawa, Hisao: *See*—
Kato, Yasushi; and Furukawa, Hisao, 4,427,824, Cl. 524-858.000.
Furukawa, Nobuhiro; Inoue, Kenji; and Murakami, Shuzo, to Sanyo Electric Co., Ltd. Alkaline battery. 4,427,751, Cl. 429-206.000.
Furukawa, Shunsuke: *See*—
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GAF Corporation: *See*—
Brown, Michael J., 4,427,439, Cl. 11-94.000.
Gaffar, Abdul, to Colgate-Palmolive Company. Antigingivitis composition. 4,427,652, Cl. 424-52.000.
Gafford, Alexander T., to Allis-Chalmers Corporation. Hydraulic system providing equalized load on implement support wheels. 4,427,207, Cl. 280-43.230.
Gagneux, Andre: *See*—
Allgeier, Hans; and Gagneux, Andre, 4,427,590, Cl. 260-245.500.
Gagnon, Francis M.: *See*—
Smith, David W.; and Gagnon, Francis M., 4,426,754, Cl. 24-17.0AP.
Gailey, J. Lynn, to Alcan Aluminum Corporation. Vertical ceiling assembly and stringer therefor. 4,426,822, Cl. 52-669.000.
Gaines, George L., Jr.; Piacente, Patricia A.; Ward, William J., III; Smith, Peter C.; Gallivan, Timothy J.; and Laska, Harry M., to General Electric Company. Method of producing fugitive binder-containing nuclear fuel material. 4,427,579, Cl. 252-639.000.
Galerne, Andre. Mixed gas bell diving deep ocean simulator. 4,427,385, Cl. 434-29.000.
Galis, Leon A.; and Czarnik, Richard J., to Ambac Industries, Inc. Resilient drive for fuel injection pump governors. 4,426,970, Cl. 123-364.000.
Gallivan, Timothy J.: *See*—
Gaines, George L., Jr.; Piacente, Patricia A.; Ward, William J., III; Smith, Peter C.; Gallivan, Timothy J.; and Laska, Harry M., 4,427,579, Cl. 252-639.000.
Galvin, Aaron A., to American District Telegraph Company. Infrared imaging system. 4,427,888, Cl. 250-331.000.
Gang-Nail Systems, Inc.: *See*—
Harris, Roderick E., 4,427,145, Cl. 225-97.000.
Garcia, Gilberto G.: *See*—
MacKay, Patrick W.; and Garcia, Gilberto G., 4,427,135, Cl. 222-368.000.
MacKay, Patrick W.; and Garcia, Gilberto G., 4,427,136, Cl. 222-368.000.
Garfinkle, Marvin. Method of rotary refining and casting. 4,427,052, Cl. 164-495.000.
Garner, John N.; Roberge, Jean M.; and Meilenner, Norbert J., to Northern Telecom Limited. Apparatus for stranding wires. 4,426,838, Cl. 57-293.000.
Garner, John N.; and Roberge, Jean M., to Northern Telecom Limited. Stranding wires. 4,426,839, Cl. 57-293.000.
Garrett Corporation, The: *See*—
Blake, James E. T., 4,427,309, Cl. 384-286.000.
Kindlimann, Lynn E., 4,427,461, Cl. 148-16.600.
Garruto, Edward J.: *See*—
Hosek, William S.; and Garruto, Edward J., 4,426,958, Cl. 122-4.00D.
Gasper, John, to Eastman Kodak Company. Scratch suppressing illumination system for photographic printer. 4,427,283, Cl. 355-1.000.
Gasser, Hermann: *See*—
Briner, Emil; Novak, Peter; and Gasser, Hermann, 4,426,836, Cl. 57-267.000.
Gates, Frank M. Collapsible display sign assembly. 4,426,801, Cl. 40-606.000.
Gatny, David A., to W-F Industries, Inc. Die set and billet for use therein. 4,426,872, Cl. 72-359.000.
Gaudino, Larry J.: *See*—
Wingert, Philip; Gaudino, Larry J.; and Kim, Han J., 4,427,625, Cl. 419-21.000.
Gauje, Georges M. C. A., to Societe Nationale d'Etude et de Construction de Moteurs d'Aviation "S.N.E.C.M.A.". Vapor phase process for the deposition of a protective metal coating on a metallic piece. 4,427,720, Cl. 427-237.000.
Gaur, Santosh P.: *See*—
Anantha, Narasipur G.; Bhatia, Harsaran S.; Gaur, Santosh P.; and Walsh, James L., 4,427,989, Cl. 357-21.000.
Gausepohl, Hermann: *See*—
Echte, Adolf; Gausepohl, Hermann; Hofmann, Hermann P.; and Mittnacht, Hans, 4,427,826, Cl. 525-53.000.

Gauthier, Francis, to Thomson-CSF. Process for producing an object with a chiralic structure obtained from a shapeable material source. 4,427,717, Cl. 427-163.000.

Gearhart Industries Incorporated: *See*—
Johns, Samuel E., Jr., 4,428,072, Cl. 367-69.000.

Gebhard, Georg: *See*—
Knecht, Klaus; Gebhard, Georg; and Rohr, Franz, 4,427,622, Cl. 376-260.000.

Gebrauchs Gerate GmbH: *See*—
Wolfrum, Emil, 4,427,726, Cl. 428-43.000.

GEFITEC S.A.: *See*—
Posso, Patrick, 4,428,013, Cl. 360-133.000.

Gehrig, Wilhelm: *See*—
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Gehring, Johann: *See*—
Birkle, Siegfried; Stoger, Klaus; Gehring, Johann; and de Vries, Hans, 4,427,522, Cl. 204-279.000.
de Vries, Hans; Birkle, Siegfried; Stoeger, Klaus; and Gehring, Johann, 4,427,518, Cl. 204-201.000.

Geldwerth, Simon; and Rubin, Mendek, to Do-All Jewelry Mgf. Co., Inc. Slip-on connector for jewelry clasp and blank for clasp. 4,426,854, Cl. 63-4.000.

General Battery Corporation: *See*—
Oxenreider, Terry; and Eberle, William J., 4,427,617, Cl. 264-296.000.

General Clutch Corp.: *See*—
Rude, Edward T.; Nisenson, Jules; and Waine, Martin, 4,427,100, Cl. 192-43.000.

General Dynamics: *See*—
Speer, Spencer J., 4,426,910, Cl. 89-1.816.

General Electric Ceramics, Inc.: *See*—
Hargis, Billy M., 4,426,773, Cl. 29-832.000.

General Electric Company: *See*—
Anderson, Roy E., 4,427,984, Cl. 343-764.000.
Banucci, Eugene G.; and Olander, Walter K., 4,427,594, Cl. 260-429.00C.
Bell, Frederic C., Sr.; Nicholson, George T.; Shade, Russell L., Jr.; and Skinner, David R., 4,427,058, Cl. 165-160.000.
Berman, Max; Klimmek, William G.; and Konrad, Charles E., 4,427,930, Cl. 318-301.000.
Cox, Charles W., 4,427,255, Cl. 339-127.00C.
Dills, Raymond L., 4,427,867, Cl. 219-10.55F.
Fichot, Julie Y.; and Roesch, Alfred, 4,427,993, Cl. 357-81.000.
Frank, James P., 4,426,770, Cl. 29-596.000.
Gaines, George L., Jr.; Piacente, Patricia A.; Ward, William J., III; Smith, Peter C.; Gallivan, Timothy J.; and Laska, Harry M., 4,427,579, Cl. 252-639.000.
Giles, Harold F., Jr.; and Schlich, William R., 4,427,830, Cl. 525-180.000.
Hall, Robert N., 4,427,839, Cl. 136-255.000.
Howard, Norman C.; Miller, Kenneth R.; and Lussier, Matthew C., 4,427,623, Cl. 376-263.000.
Howell, Edward K., 4,428,019, Cl. 361-45.000.
Kelley, John R.; and Zurbrick, John R., 4,428,055, Cl. 364-474.000.
Prochazka, Svante; and Klug, Frederic J., 4,427,785, Cl. 501-128.000.
Richter, Eike; and Lenz, Henry G., 4,427,910, Cl. 310-214.000.
Roberts, Victor D., 4,427,955, Cl. 333-177.000.
Siwek, Erwin G., 4,427,716, Cl. 427-99.000.
Tupper, Leland C., 4,427,934, Cl. 318-723.000.

General Foods Corporation: *See*—
El-Hag, Nabil A., 4,427,706, Cl. 426-243.000.
Guhi, Thomas E.; Kenyon, Ralph E.; and Mozeke, Patricia A., 4,427,709, Cl. 426-578.000.

General Foods Limited: *See*—
Coles, Robert E.; Compton, Douglas R.; Lawrence, Jack; and Carpenter, William A., 4,427,108, Cl. 206-44.00R.

General Motors Corporation: *See*—
Cornelius, Walter; and Klomp, Edward D., 4,426,841, Cl. 60-39.230.
Kondziola, Joseph D., 4,427,163, Cl. 242-107.000.
Kuo, Hong-Hsiang, 4,426,936, Cl. 110-245.000.
Trenne, Myron U., 4,427,151, Cl. 239-87.000.
Van Ee, Richard J., 4,427,099, Cl. 192-3.290.

General Research of Electronics, Inc.: *See*—
Imazeki, Kazuyoshi; and Tanaka, Toshiyuki, 4,427,904, Cl. 307-463.000.

General Signal Corporation: *See*—
Greaves, James D., 4,427,023, Cl. 137-240.000.

Genth, Hermann: *See*—
Kuhle, Engelbert; Paulus, Wilfried; Klauke, Erich; and Genth, Hermann, 4,427,698, Cl. 424-321.000.

Georges, Adrien J. P.; and Gonchond, Jean-Pierre. Variable temperature stage device for electron microscope. 4,427,891, Cl. 250-443.100.

Georgia-Pacific Corporation: *See*—
Zdybak, Walter T., 4,427,449, Cl. 106-277.000.

Gerber Garment Technology, Inc.: *See*—
Gerber, Heinz J.; Mishli, Yuval; Carulli, Vincent J.; and Cohen, Joseph H., 4,426,783, Cl. 33-1.00M.

Gerber, Heinz J.; Mishli, Yuval; Carulli, Vincent J.; and Cohen, Joseph H., to Gerber Garment Technology, Inc. Marking instrument actuator for plotting apparatus or the like. 4,426,783, Cl. 33-1.00M.

Gernet, Hermann. Aniseikonia eyeglass lens with progressive magnification. 4,427,272, Cl. 351-173.000.

Gersten, Shimon: *See*—
Chari, Venu; Duke, Jack R.; and Gersten, Shimon, 4,428,046, Cl. 364-200.000.

Gessert, James M., to Honeywell Inc. Real time fill circuit. 4,428,059, Cl. 364-577.000.

Getty Oil Company: *See*—
Friedman, Robert H., 4,427,069, Cl. 166-295.000.

Gewerkschaft Eisenhutte Westfalia: *See*—
Weirich, Walter; Rosenberg, Harry; and Becker, Kunibert, 4,427,321, Cl. 405-294.000.

Geyer, Robert P., to Standard Car Truck Company. Friction casting bolster pocket wear plate having a plurality of sides. 4,426,934, Cl. 105-197.0DB.

Ghestem, Gerard: *See*—
Dambrine, Francis; and Ghestem, Gerard, 4,427,377, Cl. 432-106.000.

Gibson, Frank, to Reed International P.L.C. Decorative wallcovering in roll form. 4,427,731, Cl. 428-159.000.

Gifford, Lawrence A.: *See*—
Malcolme-Lawes, David J.; and Gifford, Lawrence A., 4,427,892, Cl. 250-458.100.

Gilbert, Jack J. Apparatus for entraining gasoline in air for use in an internal combustion engine. 4,426,984, Cl. 123-522.000.

Giles, Harold F., Jr.; and Schlich, William R., to General Electric Company. Polyetherimide-polypropylene blends. 4,427,830, Cl. 525-180.000.

Gille, Friedrich: *See*—
Winter, Karl; Gille, Friedrich; and Lotz, Hans, 4,426,856, Cl. 66-212.000.

Gillett, James E.; and Wineman, Arthur L., to Westinghouse Electric Corp. Jacking mechanism for upper internals structure of a liquid metal nuclear reactor. 4,427,621, Cl. 376-260.000.

Gillette, Frank C., Jr.; Bryan, Ernest C.; and Nethaway, Douglas H., to United Technologies Corporation. Method for cryogenic proof testing of rotating parts. 4,427,304, Cl. 374-46.000.

Gillette, Jeffrey L.; and Hillery, Donald W., to PPG Industries, Inc. Container securing device. 4,426,863, Cl. 70-164.000.

Gilovich, Paul A.; and Toreson, James S., to Microcomputer Systems Corporation. Vented magnetic tape read head. 4,428,011, Cl. 360-102.000.

Gilvarg, Charles; and Kingsbury, William D., to SmithKline Beckman Corporation. Antimicrobial disulfide prodrugs. 4,427,582, Cl. 260-112.50R.

Giolitti, Nicolo, to Remington Ind. E. Com. de Sistemas para Escritorio S. A. Ribbon cartridge for a typewriter. 4,427,313, Cl. 400-208.000.

Girard, Theodore A., to Glyco, Inc. Agglomerated halo-hydantoins. 4,427,692, Cl. 424-273.00R.

Glaser, David; and Wheichel, Charles J. Flat-panel display and method of manufacture. 4,427,479, Cl. 156-286.000.

Glaverbel: *See*—
Servais, Albert; Toussaint, Francois; and Rogghe, Hugo, 4,427,488, Cl. 156-663.000.

Glaxo Group Limited: *See*—
Ayres, Barry; O'Callaghan, Cynthia; Livermore, David G. H.; and Newall, Christopher E., 4,427,675, Cl. 424-246.000.

Glover, Richard E. Inline fuel filter device. 4,427,542, Cl. 210-121.000.

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GNB Batteries Inc.: *See*—
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Godec, Maksimilijan; Foster, John R.; Straub, Paul J.; and Mahler, Allan K., to Von Duprin, Inc. Latching device. 4,427,223, Cl. 292-92.000.

Goeke, George L.: *See*—
Miles, David L.; Karol, Frederick J.; and Goeke, George L., 4,427,573, Cl. 502-111.000.

Goerth, Helmut: *See*—
Tonne, Peter; Mueller, Elisabeth R.; and Goerth, Helmut, 4,427,600, Cl. 260-505.00E.

Goldman, Arnold J. Direct and diffused solar radiation collector. 4,427,838, Cl. 136-248.000.

Goldman, Melvin. Tooth reconstruction. 4,427,383, Cl. 433-220.000.

Goldstein, Jack, to New York Blood Center, Inc. Enzymatic conversion of red cells for transfusion. 4,427,777, Cl. 435-240.000.

Golf-Eze: *See*—
Savard, Hassel J., Jr., 4,427,084, Cl. 180-19.00H.

Goltz, Kurt, to Pennwalt Corporation. Phosphate conversion coatings for metals with reduced coating weights and crystal sizes. 4,427,459, Cl. 148-6.15R.

Gomi, Kenichi: *See*—
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Gong, Cheng S.: *See*—
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Gonzalez, Miguel M., to Empress Cubana Importadora de Materias Primasy Productos. Explosive mixture for blasting. 4,427,465, Cl. 149-2.000.

Gonzalez, Roberto: *See*—
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Goodrich, Lloyd P. Navigation position plotter. 4,426,789, Cl. 33-431.000.
Gordon, John L.: *See—*
Dingle, John T.; Gordon, John L.; Jones, Geraint; Knight, Clive G.; and Lowe, John S., 4,427,649, Cl. 424-38.000.
Gorondy, Emery J., to Du Pont de Nemours, E. I., and Company. Magnetic printing of disperse-dyeable textile material. 4,427,412, Cl. 8-471.000.
Gould, Richard: *See—*
Seiter, George M.; and Gould, Richard, 4,427,148, Cl. 229-43.000.
Grabbe, Dimitry G., to AMP Incorporated. Moisture getter for integrated circuit packages. 4,426,769, Cl. 29-588.000.
Graco Inc.: *See—*
Schaefer, Thomas J., 4,427,153, Cl. 239-117.000.
Grade, Reinhardt: *See—*
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Graetzel, Michael; Kalyanasundaram, Kuppuswamy; Duonghong, Dung; Neumann-Spallart, Michael; and Borgarello, Enrico, to Graetzel, Michael. Product intended to be used as a photocatalyst, method for the preparation of such product and utilization of such product. 4,427,749, Cl. 429-111.000.
Grant, Barbara D.; and Jones, Carol R., to International Business Machines Corporation. Process for making an encapsulated circuit board and products made thereby. 4,427,478, Cl. 156-275.500.
Gratzinger, Paul G.; and Kucharski, Lawrence, Jr., to Bourns, Inc. Pivoting rotor ratchet mechanism for worm gear potentiometer. 4,427,966, Cl. 338-162.000.
Gray, Lorin S., III; Mattor, John A.; Millard, Ben; and Ward, Franklin J., to Scott Paper Company. Surface replication on a coated substrate. 4,427,732, Cl. 428-172.000.
Great Lakes Carbon Corporation: *See—*
Hsu, Harry L.; Grindstaff, Lloyd I.; and Juel, Leslie H., 4,427,540, Cl. 208-131.000.
Greaves, James D., to General Signal Corporation. Dry product valve. 4,427,023, Cl. 137-240.000.
Grebenstein, Hermann; and Speich, Jorge, to Oehler-Wyhlen-Lagertechnik AG. Equipment for lifting, transporting and setting down elongate goods. 4,427,331, Cl. 414-277.000.
Green, Lawrence E.; and Wareham, Richard R., to Polaroid Corporation. Apparatus for mounting transparency film. 4,427,486, Cl. 156-517.000.
Greenfield, John C.: *See—*
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Gregorian, Razmic S.; and Namboodri, Chettoor G., to United Merchants and Manufactures, Inc. Method for preparation of fabrics. 4,427,409, Cl. 8-107.000.
Gregory, Michael A.; and Traeger, Glenn N. Flexible standpipe and subsurface pressure seal. 4,427,024, Cl. 137-362.000.
Greiner, Max; Laufer, Helmut; and Straubel, Max, to Robert Bosch GmbH. Apparatus for detecting the fuel quantity delivered to the combustion chambers of a diesel engine. 4,426,981, Cl. 123-488.000.
Greiner, Max; Grimm, Gerold; and Knapp, Heinrich, to Robert Bosch GmbH. Control element. 4,426,988, Cl. 123-585.000.
Grenfell, Julian P. Mercury holder for electric discharge lamps. 4,427,919, Cl. 313-546.000.
Griffin, James: *See—*
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Grimes, Donald L.: *See—*
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Grimm, Gerold: *See—*
Greiner, Max; Grimm, Gerold; and Knapp, Heinrich, 4,426,988, Cl. 123-585.000.
Grinde, James E., to Yamaha Hatsudoki Kabushiki Kaisha. Starting arrangement for internal combustion engine. 4,426,961, Cl. 123-179.05E.
Grindstaff, Lloyd I.: *See—*
Hsu, Harry L.; Grindstaff, Lloyd I.; and Juel, Leslie H., 4,427,540, Cl. 208-131.000.
Groothuis, Michel, to Compagnie des Montres Longines. Timepiece with a perpetual calendar mechanism. 4,427,300, Cl. 368-37.000.
Grosse, Jurgen; and Pieper, Werner, to Hoechst Aktiengesellschaft. Process for making phosphonic acid ester chlorides. 4,427,603, Cl. 260-969.000.
Grouhel, Agnes G.: *See—*
Torossian, Dieran R.; Aubard, Gilbert G.; Roux, Claude P.; and Grouhel, Agnes G., 4,427,671, Cl. 424-243.000.
Gruber, Peter: *See—*
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Grudkowski, Thomas W.: *See—*
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Gruetzmacher, Robert R.; and Munger, Stanley H., to Du Pont de Nemours, E. I., and Company. Process for preparing an overcoated photopolymer printing plate. 4,427,759, Cl. 430-273.000.
Grumman Aerospace Corporation: *See—*
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Grundfos A/S: *See—*
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Grunwald, Louis J.: *See—*
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Gruppo Lepetit S.p.A.: *See—*
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GSE, Inc.: *See—*
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GTE Automatic Electric Labs. Inc.: *See—*
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GTE Laboratories Incorporated: *See—*
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Proud, Joseph M.; Smith, Robert K.; and Fallier, Charles N., Jr., 4,427,920, Cl. 315-248.000.
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Proud, Joseph M.; Smith, Robert K.; and Fallier, Charles N., Jr., 4,427,925, Cl. 315-248.000.
Sarin, Vinod K.; and Oberhauser, Peter, 4,427,082, Cl. 175-413.000.
GTE Products Corporation: *See—*
Brower, Boyd G., 4,427,368, Cl. 431-359.000.
Brower, Boyd G., 4,427,369, Cl. 431-359.000.
Proud, Joseph M.; and Johnson, Stephen G., 4,427,921, Cl. 315-248.000.
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Proud, Joseph M.; Lapatovich, Walter P.; and Johnson, Stephen G., 4,427,924, Cl. 315-248.000.
Reif, Robert H.; and Stites, Francis H., 4,427,256, Cl. 339-143.00C.
Wingert, Philip; Gaudino, Larry J.; and Kim, Han J., 4,427,625, Cl. 419-21.000.
Guerlet, Jean-Paul; and Niney, Claude, to Comptoir Lyon-Alemand Louyot. Copper alloy having high electrical conductivity and high mechanical characteristics. 4,427,627, Cl. 420-496.000.
Guhl, Thomas E.; Kenyon, Ralph E.; and Mozeke, Patricia A., to General Foods Corporation. Powdered cheesecake mix. 4,427,709, Cl. 426-578.000.
Guillaumont, Jacques, to Chloe Chimie. Cathode assembly for an electrolytic cell. 4,427,521, Cl. 204-275.000.
Guillermier, Bernard, to Bg Technic (Sarl). Machine for fitting spokes into wheel hubs. 4,427,047, Cl. 157-1.500.
Guimond, Roy A.; Daly, Charles F.; and Gulliksen, John E., to Koehler Manufacturing Company. Safety lamp apparatus including means for preventing accidental breakage of a bulb member. 4,428,039, Cl. 362-287.000.
Gulf Research & Development Company: *See—*
Brunn, Louis W.; and Lopez, Jaime, 4,427,534, Cl. 208-89.000.
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Gutierrez, Antonio: *See—*
Brownawell, Darrell W.; Gutierrez, Antonio; Matthews, Patricia C.; and Walker, Thad O., 4,427,564, Cl. 252-8.55R.
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Hume, Robert M., III, 4,427,744, Cl. 428-462.000.
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Haggkvist, Bjorn. Protective device for motorcycles. 4,427,214, Cl. 280-752.000.
Hahn, Rainer, to Dragerwerk Aktiengesellschaft. Chemical oxygen generator. 4,427,635, Cl. 422-113.000.
Hahn, Steven, to High Stoy Technological Corporation. Low leakage filtered power supply. 4,428,018, Cl. 361-42.000.
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Hall, Arthur B., to TP Laboratories, Inc. Combination light wire and edgewise appliance. 4,427,381, Cl. 433-14.000.
Hall, George D., to Rockwell International Corporation. Portable fastening tool with manual turn on and automatic shut off. 4,427,077, Cl. 173-12.000.
Hall, Lewis: *See—*
Burdette, George W.; and Hall, Lewis, 4,427,467, Cl. 149-109.400.
Hall, Robert N., to General Electric Company. Faceted low absorptance solar cell. 4,427,839, Cl. 136-255.000.
Hallas, Robert: *See—*
Tadanier, John S.; Hallas, Robert; Freiberg, Leslie A.; and Bacino, David J., 4,427,662, Cl. 424-180.000.

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Skinner, Neal G., 4,426,882, Cl. 73-155.000.
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Halmai, Geza, to Villamosipari Kutato Intezet. Electrical machine with compressed air cooling. 4,427,908, Cl. 310-57.000.

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Bunting, Thomas G.; Centrone, Dominic A.; Sackler, Richard S.; and Halpern, Alfred, 4,427,631, Cl. 422-22.000.

Hammerschmidt, Erich; Behre, Horst; Blank, Heinz U.; and Lindner, Otto, to Bayer Aktiengesellschaft. Process for preparing 1-amino-2-naphthol-4-sulphonic acid (amidol acid). 4,427,601, Cl. 260-509.000.

Hammond, Paul S., to British Gas Corporation. Flame rectification detectors. 4,427,363, Cl. 431-66.000.

Hamprecht, Gerhard: *See*—
Rentzea, Costin; Zeeh, Bernd; Ammermann, Eberhard; Hamprecht, Gerhard; and Pommer, Ernst-Heinrich, 4,427,688, Cl. 424-270.000.

Han, Tay-Hee. Water decomposition method and device using ionization by collision. 4,427,512, Cl. 204-164.000.

Hann, Michael M.: *See*—
White, Alan C.; and Hann, Michael M., 4,427,676, Cl. 424-246.000.

Hannah, Clifford G.: *See*—
Willgoose, Kenneth; Brien, Rondald; Rose, Peter E.; and Hannah, Clifford G., 4,427,742, Cl. 428-338.000.

Hansen, Kenneth N., to Allis-Chalmers Corporation. Clutch pedal operating through a fore and aft shaft in a fire wall of a vehicle. 4,426,890, Cl. 74-478.000.

Hansson, Bertil E. R.: *See*—
Riblet, Gordon P.; and Hansson, Bertil E. R., 4,427,936, Cl. 324-58.00B.

Haraguchi, Keisuke, to Asahi Kogaku Kogyo Kabushiki Kaisha. Structure for mounting cover for automatic focus detecting device. 4,427,277, Cl. 354-402.000.

Harban, Donald C.: *See*—
Walters, John P.; Petrovich, Radomir; Daley, Gregory C.; and Harban, Donald C., 4,426,880, Cl. 73-61.200.

Harbert, Charles A.: *See*—
Welch, Willard M.; and Harbert, Charles A., 4,427,679, Cl. 424-250.000.

Hardy, Terence: *See*—
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Hareng, Michel; Hehlen, Robert; Le Berre, Serge; Leclerc, Pierre; Marcenac, Philippe; and Perbet, Jean-Noel, to Thomson-CSP. Control device for a display screen and display screen controlled by this device. 4,427,997, Cl. 358-236.000.

Hargis, Billy M., to General Electric Ceramics, Inc. Array of electronic packaging substrates. 4,426,773, Cl. 29-832.000.

Harmer, Alan L., to Battelle Memorial Institute. Double optical probe device for the determination of the refractive index of a liquid reduced to a predetermined reference temperature. 4,427,293, Cl. 356-133.000.

Harney, David E.: *See*—
Bennett, John E.; and Harney, David E., 4,427,747, Cl. 429-50.000.

Harris, Craig W.: *See*—
Catiller, Robert D.; Harris, Craig W.; and Mathews, Ronald D., 4,428,043, Cl. 364-200.000.

Harris, James M., to National Semiconductor Corporation. Method of forming expanded pad structure. 4,427,715, Cl. 427-96.000.

Harris, Joanne L.: *See*—
Reckel, Rudolph P.; and Harris, Joanne L., 4,427,779, Cl. 436-507.000.

Harris, Roderick E., to Gang-Nail Systems, Inc. Packing of nail plates. 4,427,145, Cl. 225-97.000.

Harry, Ieuan L.: *See*—
Beck, Martin H.; Krishnakumar, Suppayan M.; and Harry, Ieuan L., 4,427,476, Cl. 156-199.000.

Hart, John W.: *See*—
Brooks, George W.; Hart, John W.; and Pettersen, Egil R., 4,426,845, Cl. 60-347.000.

Hart, Robert E., to Square D Company. Control circuitry for multi-stage fans. 4,426,960, Cl. 123-41.490.

Hartman, George J., to Ogle Petroleum Inc. of California. Method of solution mining subsurface orebodies to reduce restoration activities. 4,427,235, Cl. 299-5.000.

Hartmann, Claus: *See*—
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Heron, Patrick; Hartnett, Timothy; and Wright, Adam, 4,427,718, Cl. 427-175.000.

Hascoet, Martial E.: *See*—
Bel, Roger P.; Regnier, Michel M.; and Hascoet, Martial E., 4,427,014, Cl. 128-751.000.

Hasegawa, Akira; and Tanikawa, Koichi, to Yoshida Kogyo K. K. Method for forming protective surface film on aluminum shaped articles. 4,427,458, Cl. 148-6.15R.

Hasegawa, Katsuji, to Meinan Machinery Works, Inc. Cord burying apparatus for veneer lathe. 4,427,043, Cl. 144-209.00R.

Hasegawa, Minoru, to Casio Computer Co., Ltd. Electronic device with an alarm function. 4,427,299, Cl. 368-29.000.

Hashigaki, Yasunori: *See*—
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Hashimoto, Masashi: *See*—
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Hashimoto, Shunichi: *See*—
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Haskell, John J. Apparatus for picking up laminar items. 4,427,227, Cl. 294-50.900.

Hatakeyama, Kazuaki: *See*—
Hitomi, Tomoge; Konishi, Takehisa; Ogushi, Tetsutaro; and Hatakeyama, Kazuaki, 4,427,499, Cl. 204-27.000.

Hatman, Jeffrey J.: *See*—
Evans, Joseph H.; Hatman, Jeffrey J.; and Clark, William E., 4,426,999, Cl. 126-450.000.

Haug, Edward W.: *See*—
Fransson, George E.; Johnson, Stuart J.; and Haug, Edward W., 4,427,324, Cl. 409-12.000.

Haulait, Claude: *See*—
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Havashi, Masaki: *See*—
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Haville, George D.; and Johnson, Paul A., to BEI Electronics, Inc. Modular shaft encoder system for non-binary counts. 4,427,972, Cl. 340-347.00P.

Hawley, Laird V.; and Logan, Eugene T., to Parham Industries, Inc. Auger casing latching mechanism. 4,427,105, Cl. 198-632.000.

Hayashi, Kenichi: *See*—
Iwashita, Hidemaro; Mieno, Fumiaki; Kiura, Yoshinori; and Hayashi, Kenichi, 4,427,637, Cl. 422-198.000.

Hayes, Cecil: *See*—
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Hayes, James C. Bow sight. 4,426,787, Cl. 33-265.000.

Hayn, John W.; and McDonough, Kevin C., to Texas Instruments Incorporated. Addressing a control ROM in a microcoded single-chip microcomputer using the output signals of the control ROM. 4,428,047, Cl. 364-200.000.

Hazama, Katashi: *See*—
Yuhara, Akitsuna; Iida, Shinya; Abe, Hideo; Kishimoto, Kiyoharu; and Hazama, Katashi, 4,427,515, Cl. 204-192.00E.

Hazel, Robert L.; and Kammerud, John E., to Burroughs Corporation. Apparatus for preformatting an optical disk. 4,428,069, Cl. 365-215.000.

Hazel, Robert L.; and Kammerud, John E., to Burroughs Corporation. Methods of preformatting an optical disk. 4,428,075, Cl. 369-45.000.

Headrick, Richard T. Surge dampening baffle for liquid storage tanks. 4,427,045, Cl. 150-55.000.

Heavener, Michael G., to Memtel Corporation. Heating and cooling system using ground water. 4,427,055, Cl. 165-29.000.

Hedlund, Lenas J.; and Puligandla, Viswanadham, to International Business Machines Corporation. Corrosion inhibiting compositions for metals. 4,427,448, Cl. 106-14.270.

Hefftler, Victor: *See*—
Kahlert, Peter; Schone, Helmut; Johne, Hans; Jentzsch, Arndt; Hefftler, Victor; Kuhnert, Werner; Karl, Rainer; Dittmann, Norbert; Fink, Heiner; and Preusger, Karl-Heinz, 4,427,193, Cl. 271-277.000.

Hegemann, Karl-Rudolf; and Weissert, Helmut. Gas control system for steel-making converters. 4,427,183, Cl. 266-44.000.

Hehlen, Robert: *See*—
Hareng, Michel; Hehlen, Robert; Le Berre, Serge; Leclerc, Pierre; Marcenac, Philippe; and Perbet, Jean-Noel, 4,427,997, Cl. 358-236.000.

Heidelberger Druckmaschinen Aktiengesellschaft: *See*—
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Heilgeist, Michael, to Kernforschungszentrum Karlsruhe GmbH. Method for reducing the acid content of a nitric acid solution by using electrolysis current. 4,427,503, Cl. 204-101.000.

Heimgartner, Roland: *See*—
Comploi, Georg; Heimgartner, Roland; Loacker, Artur; Huber, Kurt; and Wallimann, Hans, 4,426,941, Cl. 112-84.000.

Heine, Christian; and Wust, Reinhold, to Henkel KGaA. Method for the production of food additives with improved taste. 4,427,707, Cl. 426-312.000.

Heinlein, Hans. Pourer for bottle-like containers. 4,427,138, Cl. 222-546.000.

Heinz, Theodore A., to Rockwell International Corporation. Method for making unitary, hollow structures. 4,427,497, Cl. 204-16.000.

Heinzel, Irving C.: *See*—
Brooks, William R.; and Heinzel, Irving C., 4,427,039, Cl. 141-20.000.

Helling, Danie W. Illuminated fishing lure. 4,426,803, Cl. 43-17.600.

Hempy, Harry O.; Kirkpatrick, Charles R.; and Robinson, Francis L., to International Business Machines Corporation. Controlling buffered peripheral subsystems. 4,428,064, Cl. 364-900.000.

Henderson, Gerald O.: *See*—
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Hendriks, Emerie F. M.; and Cadee, Theodorus P. M., to Van Doorne's Transmissie B.V. Composite driving belt with transverse and intermediate elements. 4,427,401, Cl. 474-201.000.

Henkel KGaA: *See*—
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Hepler, Ernest M.: *See*—
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Reinehr, Ulrich; Dross, Joachim; Herbertz, Toni; Jungverdorben, Hermann-Josef; and Burghartz, Hans K., 4,427,613, Cl. 264-206.000.
Herdman, Charles W. Shoelace knot retainer. 4,426,756, Cl. 24-119.000.
Hergenrother, William L.; Matlock, Mark G.; and Ambrose, Richard J., to Firestone Tire & Rubber Company, The. Impact resistant polymeric compositions containing polyamides, maleic anhydride adducts of hydrogenated polymers and graft copolymers thereof. 4,427,828, Cl. 525-66.000.
Hermann Hirsch Leder und Kunstoffwarenfabrik: *See*—
Matthias, Jan H., 4,427,303, Cl. 368-282.000.
Heron, Patrick; Hartnett, Timothy; and Wright, Adam. Wedge encapsulation method. 4,427,718, Cl. 427-175.000.
Hess, Stanley E. Panel clamp. 4,427,191, Cl. 269-43.000.
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Baron, Kenneth S.; and Wood, David W., 4,427,002, Cl. 128-83.000.
Moulton, Richard J.; and Neuner, John D., 4,427,802, Cl. 523-222.000.
Heyn, William M., to Continental Group, Inc., The. Can and closure therefor. 4,427,128, Cl. 220-270.000.
Hickman, Mark; and Brown, Michael M., to Vee Arc Corporation. Optimum transistor drive circuit with over load compensation. 4,427,902, Cl. 307-270.000.
Hidaka, Norio: *See*—
Yamamura, Shigeyuki; Kosemura, Kinjiro; Shima, Takao; and Hidaka, Norio, 4,427,991, Cl. 357-74.000.
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Hill, Ashley, to James Mackie & Sons Ltd. Shuttleless looms. 4,427,037, Cl. 139-449.000.
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Hilti Aktiengesellschaft: *See*—
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Himsley, Alexander, to Himsley Engineering Limited. Ion exchange process. 4,427,639, Cl. 423-7.000.
Himsley Engineering Limited: *See*—
Himsley, Alexander, 4,427,639, Cl. 423-7.000.
Hines, Clyde K.; and Fettig, Lyle, to Everett/Charles Test Equipment, Inc. Printed circuit board test fixture with compliant platen. 4,427,250, Cl. 339-75.00M.
Hintsch, Otto; and Julich, Werner, to Sulzer Brothers Limited. Clutch arrangement for a heddle of a weaving machine. 4,427,035, Cl. 139-76.000.
Hirai, Osamu: *See*—
Nishizawa, Hiroshi; Mukoyama, Yoshiyuki; and Hirai, Osamu, 4,427,822, Cl. 524-726.000.
Hiraishi, Shunichi: *See*—
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Hirama, Yutaka; Takahashi, Kenzoh; and Hori, Sadayuki, to Hitachi Elevator Engineering and Service Co., Ltd. Electromagnetic inspecting apparatus for magnetizable wire rope. 4,427,940, Cl. 324-240.000.
Hirata, Atsumi, to Victor Company of Japan, Ltd. Special effects video disc reproducing system for eliminating picture flicker. 4,428,002, Cl. 358-342.000.
Hiratsuka, Ko: *See*—
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Hirayama, Chikara: *See*—
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Amada, Nobutaka; Nakagaki, Harushige; and Inoue, Shigeki, 4,427,951, Cl. 330-298.000.
Endo, Satoru; and Yamauchi, Masaaki, 4,427,397, Cl. 445-49.000.
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Kuboki, Shigeo; Hirayama, Takeshi; and Nakamura, Hideo, 4,428,051, Cl. 364-431.120.
Kuriyama, Shigeru; Nemoto, Kiyosi; and Horiuchi, Michimasa, 4,427,928, Cl. 318-139.000.
Mizushima, Masashi; Ehata, Shigeru; Maruyama, Masanori; and Fukushima, Masakazu, 4,427,917, Cl. 313-389.000.
Onuki, Keiichi; Nakagawa, Tooru; and Inoue, Tadashi, 4,426,968, Cl. 123-339.000.
Sakamoto, Takashi; Suto, Jinkichi; and Moriuchi, Hisahiro, 4,428,067, Cl. 365-104.000.
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Yamashiro, Osamu; and Hongo, Toyohiko, 4,428,040, Cl. 363-62.000.
Yuhara, Akitsuna; Iida, Shinya; Abe, Hideo; Kishimoto, Kiyoharu; and Hazama, Katashi, 4,427,515, Cl. 204-192.00E.
Hitomi, Tomoge; Konishi, Takehisa; Ogushi, Tetsutaro; and Hatakeyama, Kazuaki, to Nippon Kinzoku Co., Ltd. Process for surface treatment of stainless steel sheet. 4,427,499, Cl. 204-27.000.
Ho, Andrew W., to Chevron Research Company. 2,2-Bis(haloalkenyl)-1-substituted-1-dialkoxyphosphoroethylene fungicides. 4,427,667, Cl. 424-210.000.
Hobson, Stephan C.; and Stokes, Kerry E., to Image Industries, Inc. Tamper-resistant lug nut. 4,427,326, Cl. 411-5.000.
Hoechst Aktiengesellschaft: *See*—
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Hoffmann, Benno, to BASF Aktiengesellschaft. Heat-insulating panel. 4,426,818, Cl. 52-309.400.
Hoffmann, Erich: *See*—
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Hoffmann-La Roche Inc.: *See*—
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Newman, Edward; Nishikawa, A. Hirotoshi; Spiegel, Herbert E.; and Symington, Julia, 4,427,783, Cl. 436-542.000.
Hoffmeister, Jurgen; and Boeckh, Franz-Xaver, to Kaltenbach & Voigt GmbH & Co. Dental equipment stand. 4,427,382, Cl. 433-79.000.
Hofmann, Hermann P.: *See*—
Echte, Adolf; Gausepohl, Hermann; Hofmann, Hermann P.; and Mittnacht, Hans, 4,427,826, Cl. 525-53.000.
Hofmann, Judson A.; and Snopko, Paul A., to Zenith Radio Corporation. Television/telephone system with annunciator and intercom feature. 4,427,847, Cl. 179-2.0TV.
Hofmann, Peter; and Muller, Wolfgang H. E., to Chemische Werke Huls AG. Process for the production of predominantly linear aliphatic carboxylic acid esters. 4,427,593, Cl. 260-410.90R.
Hogan, James E.; and Camplair, George M., to Firestone Tire & Rubber Company, The. Crush cutter. 4,426,901, Cl. 83-861.000.
Hohsai, Kohichiro: *See*—
Terada, Masaki; Yoshimura, Akihiro; Hohsai, Kohichiro; and Minami, Junichi, 4,427,710, Cl. 426-634.000.
Holland Co.: *See*—
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Holmes, Paul A.: *See*—
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Holmstrand, Paul: *See*—
Dokmo, Richard C.; Hepler, Ernest M.; and Holmstrand, Paul, 4,426,834, Cl. 57-10.000.
Holstedt, Richard A.; and Jessup, Peter, to Union Oil Company of California. Anti-oxidation and corrosion inhibitors for boron-containing lubricants. 4,427,560, Cl. 252-42.700.
Holzer, Helmut; and Ehrmann, Peter, to Carl Freudenberg, Firma. Radial shaft sealing ring. 4,427,205, Cl. 277-134.000.
Holzl, Robert A.; Benander, Robert E.; and Davis, Robert D., to Dart Industries, Inc. Tungsten alloys containing A15 structure and method for making same. 4,427,445, Cl. 75-234.000.
Honda Giken Kogyo Kabushiki Kaisha: *See*—
Inoue, Kazuo; and Otsuka, Tsuneo, 4,427,087, Cl. 180-219.000.
Otani, Junji; Okubo, Akira; and Kushibiki, Takashi, 4,426,962, Cl. 123-179.00H.
Tsuboi, Masaharu, 4,427,088, Cl. 180-219.000.
Honda, Ronald T.: *See*—
Buchtel, Michael E.; and Honda, Ronald T., 4,427,878, Cl. 250-203.00R.

Honeywell Inc.: *See*—
Gessert, James M., 4,428,059, Cl. 364-577.000.
Hongo, Toyohiko: *See*—
Yamashiro, Osamu; and Hongo, Toyohiko, 4,428,040, Cl. 363-62.000.
Honig, Helmut: *See*—
Doetsch, Werner; Dillenburg, Helmut; Fuchs, Paul-Wilhelm; and Honig, Helmut, 4,427,644, Cl. 423-582.000.
Honkawa, Yoshinori, to Ryobi Ltd. Device for preventing irregular supplying of printing sheets for printing machine. 4,428,041, Cl. 364-183.000.
Hooker, Donald E.; and Tojza, Roman A., to Bally Manufacturing Corporation. Rotatable reel indexing having shock absorbing capability. 4,427,196, Cl. 273-143.00R.
Hoover, Lonnie D.: *See*—
House, Roy F.; and Hoover, Lonnie D., 4,427,556, Cl. 252-8.50A.
Hope, Dana R., to United States of America, Air Force. Yoke mover. 4,427,388, Cl. 434-45.000.
Hoppe, Robert F.: *See*—
Applequist, Roy A.; Altobellis, Richard M.; Bagnell, Glade N.; Hoppe, Robert F.; Jacques, James O.; and Johnson, Terry G., 4,428,012, Cl. 360-106.000.
Hori, Sadayuki: *See*—
Hirama, Yutaka; Takahashi, Kenzoh; and Hori, Sadayuki, 4,427,940, Cl. 324-240.000.
Horinek, Herbert J.: *See*—
Kierbow, Gerald C.; and Horinek, Herbert J., 4,427,133, Cl. 222-77.000.
Horita, Yukio: *See*—
Senno, Harufumi; Wakamiya, Masayuki; and Horita, Yukio, 4,427,462, Cl. 148-31.550.
Horiuchi, Michimasa: *See*—
Kuriyama, Shigeru; Nemoto, Kiyosi; and Horiuchi, Michimasa, 4,427,928, Cl. 318-139.000.
Hornok, Emery; and Killian, Gary L., to Aerotech, Incorporated. Tool changer. 4,426,763, Cl. 29-568.000.
Horodysky, Andrew G.; and Braid, Milton, to Mobil Oil Corporation. Friction reducers for lubricants and fuels. 4,427,562, Cl. 252-51.50A.
Horrigan, Richard. Safety release pet collar. 4,426,957, Cl. 119-106.000.
Horton, Derek; and Priebe, Waldemar, to United States of America, Health and Human Services. 2'Halo derivatives of daunomycin, desmethoxy daunomycin, adriamycin and carminomycin. 4,427,664, Cl. 424-180.000.
Horton Industries, Inc.: *See*—
Schilling, Hugh K., 4,427,102, Cl. 192-85.00A.
Horvath, Stephen J.: *See*—
Loftus, Peter J.; and Horvath, Stephen J., 4,426,785, Cl. 33-147.00L.
Hosek, William S.; and Garruto, Edward J., to Curtiss-Wright Corporation. Fluidized bed combustor and coal gun-tube assembly therefor. 4,426,958, Cl. 122-4.00D.
Hoshi, Toshio, to Komori Printing Machinery Co., Ltd. Signature transfer device in a folder for a rotary printing press. 4,427,405, Cl. 493-444.000.
Hosokawa, Minoru, to Kabushiki Kaisha Suwa Seikosha. Driving system for matrix liquid crystal display with nonlinear-switches. 4,427,266, Cl. 350-333.000.
Hosomizu, Hiroshi: *See*—
Ishida, Tokuji; and Hosomizu, Hiroshi, 4,427,278, Cl. 354-416.000.
Hosten, Daniel: *See*—
Bahnsen, Heiner; and Hosten, Daniel, 4,427,520, Cl. 204-224.00R.
Hourticolon, Roland; Roth, Gerhard; Frenken, Hans; Schaffer, Helmut; and Koepke, Gunther, to Agfa-Gevaert Aktiengesellschaft. Web guide roller for use at high speeds and process for producing the same. 4,426,757, Cl. 29-121.800.
House, Roy F.; and Hoover, Lonnie D., to NL Industries, Inc. Dispersible hydrophilic polymer compositions. 4,427,556, Cl. 252-8.50A.
Howard, Norman C.; Miller, Kenneth R.; and Lussier, Matthew C., to General Electric Company. Automatic fuel transfer apparatus and method. 4,427,623, Cl. 376-263.000.
Howarth, Thomas T.: *See*—
Cole, Martin; Howarth, Thomas T.; and Reading, Christopher, 4,427,690, Cl. 424-272.000.
Howell, Edward K., to General Electric Company. Ground fault circuit interrupting device with improved integrated circuit power supply. 4,428,019, Cl. 361-45.000.
Howell, George L.; and Lambrix, Gregg F., to F. M. Howell & Company. Protective packaging container for electrostatic discharge sensitive devices. 4,427,114, Cl. 206-328.000.
Howett, Deborah L.: *See*—
Corrigan, James L.; Howett, Deborah L.; and Schouten, Gerard M., 4,427,118, Cl. 211-45.000.
Hoyme, Clifford L. Valve for appliance combustion air inlet. 4,426,993, Cl. 126-85.00B.
Hsu, Harry L.; Grindstaff, Lloyd I.; and Juel, Leslie H., to Great Lakes Carbon Corporation. Production of anode grade petroleum coke. 4,427,540, Cl. 208-131.000.
Hubele, Adolf, to Ciba-Geigy Corporation. Fungicidal acyl anilides. 4,427,696, Cl. 424-309.000.
Huber, Kurt: *See*—
Complói, Georg; Heimgartner, Roland; Loacker, Artur; Huber, Kurt; and Wallimann, Hans, 4,426,941, Cl. 112-84.000.
Hudson, John L.: *See*—
Elliott, Lloyd E., Jr.; and Hudson, John L., 4,427,091, Cl. 181-120.000.
Hudspeth, Thomas; and Keeling, Harmon H., to Hughes Aircraft Company. Microwave diplexer. 4,427,953, Cl. 333-134.000.
Hufenus, Paul F. M. Tennis racket with variable balance and weight. 4,427,195, Cl. 273-73.00J.
Hughes Aircraft Company: *See*—
Hudspeth, Thomas; and Keeling, Harmon H., 4,427,953, Cl. 333-134.000.
Lee, William W. Y., 4,426,766, Cl. 29-571.000.
Margerum, J. David; and Miller, Leroy J., 4,427,569, Cl. 252-299.630.
Nesler, John J., 4,428,015, Cl. 361-18.000.
Hughes Tool Company: *See*—
Blann, Jack R.; West, Robert C.; and Abercrombie, Bolling A., 4,427,345, Cl. 417-54.000.
Hume, Robert M., III, to H. B. Fuller Company. Heat-activated pressure sensitive adhesive for bonding label stock to plastic film, metal foil and the like. 4,427,744, Cl. 428-462.000.
Humphrey, John: *See*—
Migliori, Albert, 4,427,897, Cl. 290-44.000.
Humphries, Curtis L.; Schultz, Eddie F.; and Winkelman, Alan M., to Mobil Oil Corporation. Method and apparatus for determining the foaming characteristics of crude oil. 4,426,879, Cl. 73-60.100.
Hundermark, David L.: *See*—
Reed, Samuel F.; and Hundermark, David L., 4,427,793, Cl. 521-32.000.
Hunkeler, Robert: *See*—
Meier, Werner; and Hunkeler, Robert, 4,427,605, Cl. 261-97.000.
Hunt, Patrick A.: *See*—
Backhouse, Alan J.; Thorne, Stephen J.; and Hunt, Patrick A., 4,427,820, Cl. 524-504.000.
Huntoon, Francis E., to Teletype Corporation. Apparatus for adjusting a facsimile document scanner. 4,427,998, Cl. 358-294.000.
Huser, Ludwig: *See*—
Lieberherr, Jurg; Rebsamen, Ernst; Trachsel, Felix; and Huser, Ludwig, 4,427,552, Cl. 210-741.000.
Hutchison, David A., to Atlantic Richfield Company. Stabilization of hydrocracked oils with certain dihydroxy diphenyl oxidation stabilizers. 4,427,563, Cl. 252-52.00R.
Huther, Werner; and Kruger, Wolfgang, to MTU Motoren-und Turbinen-Union. Precombustion chamber in the cylinder head of a diesel engine. 4,426,966, Cl. 123-286.000.
Hutson, Duane. Fishing float. 4,426,804, Cl. 43-44.910.
Hyatt, Charles J., to PPG Industries, Inc. Method of and apparatus for grit blast damage free score initiation. 4,427,142, Cl. 225-2.000.
Hyatt, Charles J., to PPG Industries, Inc. Apparatus for and method of initiating a damage-free score. 4,427,143, Cl. 225-2.000.
Hydro-Plan Engineering Ltd.: *See*—
Mehoudar, Raphael, 4,427,174, Cl. 251-16.000.
Hydrocarbon Research, Inc.: *See*—
Nongbri, Govanon; Brandt, Susan M.; and Chervenak, Michael C., 4,427,535, Cl. 208-112.000.
Hylsa, S.A.: *See*—
MacKay, Patrick W.; and Garcia, Gilberto G., 4,427,135, Cl. 222-368.000.
MacKay, Patrick W.; and Garcia, Gilberto G., 4,427,136, Cl. 222-368.000.
Iafrate, Gerald J.; and Ballato, Arthur, to United States of America, Army. Acoustic diffractometer. 4,427,913, Cl. 310-334.000.
Iato, Michel: *See*—
Duvet, Claude; and Iato, Michel, 4,427,218, Cl. 285-184.000.
Ichimura, Takeo: *See*—
Nakamura, Hiroshi; and Ichimura, Takeo, 4,427,784, Cl. 501-44.000.
ICI Americas Inc.: *See*—
Stockburger, George J., 4,427,557, Cl. 252-8.700.
ICI Australia Limited: *See*—
Serban, Alexander; Watson, Keith G.; and Warner, Richard B., 4,427,437, Cl. 71-92.000.
Ida, Masatoshi: *See*—
Saitou, Shinichi; and Ida, Masatoshi, 4,428,009, Cl. 360-65.000.
Ide, Tsuneyuki: *See*—
Miura, Tsuyoshi; Arakida, Yutaka; Kondo, Yoshikazu; and Ide, Tsuneyuki, 4,427,446, Cl. 75-244.000.
Iderosa, Richard A.: *See*—
Demarest, Frank C.; and Iderosa, Richard A., 4,427,296, Cl. 356-387.000.
Iguchi, Yoji: *See*—
Kakumoto, Hiromi; Ihara, Shinji; Iguchi, Yoji; and Miyata, Makoto, 4,426,776, Cl. 30-34.100.
Ihara, Shinji: *See*—
Kakumoto, Hiromi; Ihara, Shinji; Iguchi, Yoji; and Miyata, Makoto, 4,426,776, Cl. 30-34.100.
Iida, Shinya: *See*—
Yuhara, Akitsuna; Iida, Shinya; Abe, Hideo; Kishimoto, Kiyoharu; and Hazama, Katashi, 4,427,515, Cl. 204-192.00E.
Iida, Yoshio: *See*—
Aoki, Toshihiro; and Iida, Yoshio, 4,427,816, Cl. 524-357.000.
Iio, Kenji: *See*—
Yamada, Noboru; Iio, Kenji; and Shiiba, Kazuyuki, 4,426,862, Cl. 70-69.000.
Iiyama, Hiroshi: *See*—
Hirose, Hisashi; Arai, Hiroshi; Iiyama, Hiroshi; and Komiya, Hirokazu, 4,426,788, Cl. 33-395.000.
Iizuka, Kiyoshi: *See*—
Suzuki, Takashi; Iizuka, Kiyoshi; Ohtaka, Keiji; and Mizutani, Hidemasa, 4,427,265, Cl. 350-321.000.

Ikeda Bussan Co., Ltd.: *See*—
Matumoto, Hiroki, 4,427,233, Cl. 297-391.000.
Ikeda, Masashi: *See*—
Kihara, Kazuo; and Ikeda, Masashi, 4,428,066, Cl. 365-96.000.
Ikemori, Keiji, to Canon Kabushiki Kaisha. Variable magnification ratio lens. 4,427,268, Cl. 350-422.000.
Ikeyama, Norio; Sotoma, Nobuo; and Tamaru, Shusaku, to Nitto Electric Industrial Co., Ltd. Seal structure of end part of liquid separation tube. 4,427,200, Cl. 277-3.000.
Image Industries, Inc.: *See*—
Hobson, Stephan C.; and Stokes, Kerry E., 4,427,326, Cl. 411-5.000.
Imaizumi, Tomio: *See*—
Shimokura, Akihiro; and Imaizumi, Tomio, 4,427,188, Cl. 267-64.120.
Imazeki, Kazuyoshi; and Tanaka, Toshiyuki, to General Research of Electronics, Inc. Digital signal generating circuit. 4,427,904, Cl. 307-463.000.
IMC Magnetics Corp.: *See*—
Manson, Harry G., 4,427,911, Cl. 310-261.000.
Imperial Chemical Industries Limited: *See*—
Dingle, John T.; Gordon, John L.; Jones, Geraint; Knight, Clive G.; and Lowe, John S., 4,427,649, Cl. 424-38.000.
Imperial Chemical Industries PLC: *See*—
Backhouse, Alan J.; Thorne, Stephen J.; and Hunt, Patrick A., 4,427,820, Cl. 524-504.000.
Barham, Peter J.; and Holmes, Paul A., 4,427,614, Cl. 264-210.100.
Pierpoint, Edward K., 4,427,574, Cl. 502-154.000.
Inagaki, Hajime; and Wakumoto, Hiroshi, to Mitsui Petrochemical Industries Ltd. Cured or uncured filled coating composition of polyfunctional acrylic-type acid ester and utilization thereof. 4,427,823, Cl. 524-833.000.
Inagaki, Seiji: *See*—
Omiya, Shoji; Sunohara, Masaaki; Nakagawa, Tokihalu; Inagaki, Seiji; Yamawaki, Junnosuke; Nakamura, Nobuyuki; and Yanagisawa, Kaoru, 4,427,353, Cl. 425-151.000.
Inamori, Mikio: *See*—
Takenoya, Hideaki; Inamori, Mikio; and Makabe, Hachiro, 4,426,946, Cl. 112-266.100.
Indiana Wire Die Company, Inc.: *See*—
Keller, Ronald E., 4,426,954, Cl. 118-125.000.
Industrial Units (Proprietary) Limited: *See*—
Walker, Hilton R., 4,426,802, Cl. 42-59.000.
Inmont Corporation: *See*—
Chisvette, Dominick; Lattimore, James; and Patterson, Donald M., 4,427,810, Cl. 524-88.000.
Innovatum, Inc.: *See*—
Cloutier, Paul A.; Oehme, Delbert R.; and Stebbings, Ronald F., 4,427,943, Cl. 324-326.000.
Inoue-Japax Research Incorporated: *See*—
Inoue, Kiyoshi, 4,427,870, Cl. 219-69.00W.
Inoue, Kazuo; and Otsuka, Tsuneo, to Honda Giken Kogyo Kabushiki Kaisha. Motorcycle provided with an engine having a supercharger. 4,427,087, Cl. 180-219.000.
Inoue, Kenji: *See*—
Furukawa, Nobuhiro; Inoue, Kenji; and Murakami, Shuzo, 4,427,751, Cl. 429-206.000.
Inoue, Kiyoshi, to Inoue-Japax Research Incorporated. Method of and apparatus for electroerosively machining a conductive workpiece with a continuous wire electrode. 4,427,870, Cl. 219-69.00W.
Inoue, Shigeki: *See*—
Amada, Nobutaka; Nakagaki, Harushige; and Inoue, Shigeki, 4,427,951, Cl. 330-298.000.
Inoue, Shunzo; Nagasawa, Takeshi; Iwaya, Toshio; Kasuya, Michio; and Murata, Shinji, to Canon Kabushiki Kaisha. Web roll amount detecting apparatus. 4,426,883, Cl. 73-159.000.
Inoue, Soichi: *See*—
Oguri, Yasuo; Awata, Mitsuru; Saito, Junji; Inoue, Soichi; Andio, Tatsuo; and Abe, Mitsunobu, 4,427,611, Cl. 264-86.000.
Inoue, Tadashi: *See*—
Onuki, Keiichi; Nakagawa, Tooru; and Inoue, Tadashi, 4,426,968, Cl. 123-339.000.
Institut de Recherches de la Siderurgie Francaise: *See*—
Michelet, Jacques, 4,427,051, Cl. 164-448.000.
Institut Francais du Petrole: *See*—
Cholet, Jacques, 4,426,950, Cl. 114-245.000.
Institut National de la Recherche Agronomique: *See*—
Maubois, Jean-Louis; Roger, Loic; Brule, Gerard; and Piot, Michel, 4,427,658, Cl. 424-177.000.
Institut Vysokikh Temperatur Akademii Nauk SSR: *See*—
Vasilieva, Inna A.; and Urinson, Alexandr S., 4,428,058, Cl. 364-557.000.
International Business Machines Corporation: *See*—
Anantha, Narasipur G.; Bhatia, Harsaran S.; Gaur, Santosh P.; and Walsh, James L., 4,427,989, Cl. 357-21.000.
Blum, Arnold, 4,428,060, Cl. 364-715.000.
Collins, Gilbert C.; and Schiffrin, David J., 4,427,267, Cl. 350-357.000.
Dollenmayer, William L., 4,427,312, Cl. 400-144.200.
Grant, Barbara D.; and Jones, Carol R., 4,427,478, Cl. 156-275.500.
Hedlund, Lenas J.; and Puligandla, Viswanadham, 4,427,448, Cl. 106-14.270.
Hempy, Harry O.; Kirkpatrick, Charles R.; and Robinson, Francis L., 4,428,064, Cl. 364-900.000.
International Flavors & Fragrances Inc.: *See*—
Sprecker, Mark A.; Klemarczyk, Philip T.; and Belko, Robert P., 4,427,708, Cl. 426-538.000.
International Institute of Cellular and Molecular Pathology: *See*—
Masson, Pierre L.; Collet-Cassart, Daniel; and Magnusson, Carl G., 4,427,781, Cl. 436-509.000.
International Paper Company: *See*—
Eckert, Robert C., 4,427,490, Cl. 162-78.000.
International Standard Electric Corporation: *See*—
Ege, Sigmund, 4,427,033, Cl. 138-103.000.
Oldham, Ronald C., 4,427,262, Cl. 350-96.230.
International Telephone & Telegraph Corporation: *See*—
Kruger, Bradford E.; and Parr, John C., 4,427,983, Cl. 343-763.000.
Interrante, Bruno. Tamper deactivating assembly. 4,426,858, Cl. 70-1.500.
Ioptex Inc.: *See*—
Bittner, Timothy, 4,426,741, Cl. 3-13.000.
Ishibashi, Masanori, to Casio Computer Co., Ltd. Envelope control for electronic musical instrument. 4,426,904, Cl. 84-1.260.
Ishida, Tokuji; and Hosomizu, Hiroshi, to Minolta Camera Kabushiki Kaisha. Flash photography system and electronic flash device for use in the system. 4,427,278, Cl. 354-416.000.
Ishidoshiro, Hiroshi: *See*—
Sando, Yoshikazu; Niwa, Susumu; and Ishidoshiro, Hiroshi, 4,426,746, Cl. 8-149.300.
Ishigaki, Kunio: *See*—
Kitatani, Katuji; Sera, Hidefumi; Arai, Atsuaki; Ogawa, Masasi; Ishigaki, Kunio; and Ogura, Haruo, 4,427,768, Cl. 430-623.000.
Ishiguro, Mamoru: *See*—
Yamamura, Kazumasa; and Ishiguro, Mamoru, 4,428,001, Cl. 358-335.000.
Ishihara, Takeshi; Ishiwari, Michio; and Ishino, Shigeo, to NGK Insulators Ltd. Rod insulator with elastic overcoats and conducting paths straddling joint portions of adjacent overcoats. 4,427,843, Cl. 174-140.00S.
Ishii, Toshiaki: *See*—
Kodera, Yasuo; Ishii, Toshiaki; and Ohashi, Minoru, 4,427,772, Cl. 435-27.000.
Ishikawa, Hidehiko: *See*—
Misaki, Hideo; Muramatsu, Eiji; Ishikawa, Hidehiko; and Matsuura, Kazuo, 4,427,771, Cl. 435-22.000.
Ishikawa, Shozo: *See*—
Fujimura, Naoto; Tanaka, Takashi; Fujita, Takeshi; Matsumoto, Masakazu; Takebayashi, Norie; Takasu, Yoshio; and Ishikawa, Shozo, 4,427,753, Cl. 430-58.000.
Ishino, Shigeo: *See*—
Ishihara, Takeshi; Ishiwari, Michio; and Ishino, Shigeo, 4,427,843, Cl. 174-140.00S.
Ishiwari, Michio: *See*—
Ishihara, Takeshi; Ishiwari, Michio; and Ishino, Shigeo, 4,427,843, Cl. 174-140.00S.
Ishiyama, Kozo: *See*—
Sugio, Akitoshi; Masu, Masanobu; Okabe, Masao; Sasaki, Yukio; and Ishiyama, Kozo, 4,427,814, Cl. 524-126.000.
Isoda, Mitsumasa, to Kubota Ltd. Fuel injection rate limiting device for diesel engine. 4,426,971, Cl. 123-367.000.
Ito, Rokuzo, to Canada Wire and Cable Limited. Reel holder and clamping arrangement for a strander cradle assembly. 4,426,835, Cl. 57-127.700.
Ito, Teruyoshi: *See*—
Suzuki, Shosuke; Ito, Teruyoshi; Sakakibara, Yukio; Yamada, Takashi; Kubo, Fumiyoshi; Yoshimura, Kunimasa; Ugajin, Mitsuyuki; Kaji, Kiyokane; and Banno, Mitsuyuki, 4,426,975, Cl. 123-425.000.
Itoh, Noburu: *See*—
Takahashi, Toshiaki; and Itoh, Noburu, 4,427,762, Cl. 430-436.000.
ITT Industries, Inc.: *See*—
Andrei-Alexandru, Marcel; and Prohaska, Hans, 4,427,929, Cl. 318-282.000.
Reinartz, Hans D.; and Schopper, Bernd, 4,427,239, Cl. 303-22.00R.
Stoka, Roerto; and Pickel, Hajo, 4,427,096, Cl. 188-73.340.
Wilmsmeyer, Klaus, 4,428,071, Cl. 365-226.000.
Iwasaki Engineering Co., Ltd.: *See*—
Yamada, Noboru; Iio, Kenji; and Shiiba, Kazuyuki, 4,426,862, Cl. 70-69.000.
Iwasaki, Hiromi: *See*—
Kimura, Toshio; Kataoka, Kunitoshi; Yamaji, Yoshiaki; Iwasaki, Hiromi; and Yamashita, Shinichi, 4,427,869, Cl. 219-93.000.
Iwashita, Hidemaro; Mieno, Fumiaki; Kiura, Yoshinori; and Hayashi, Kenichi, to Asahi Kasei Kogyo Kabushiki Kaisha. Apparatus for producing an alkali metal salt of a mineral acid, and a process. 4,427,637, Cl. 422-198.000.
Iwashita, Kiyoji: *See*—
Abe, Nobuo; Sugawara, Hiroyuki; Kurosawa, Yukio; Wada, Akira; and Iwashita, Kiyoji, 4,427,857, Cl. 200-144.00B.
Iwashita, Tomonori; Mashimo, Yukio; Fukahori, Hidehiko; and Watanabe, Yoshitaka, to Canon Kabushiki Kaisha. Auxiliary power source device for motor driven camera. 4,427,280, Cl. 354-173.110.
Iwaya, Toshio: *See*—
Inoue, Shunzo; Nagasawa, Takeshi; Iwaya, Toshio; Kasuya, Michio; and Murata, Shinji, 4,426,883, Cl. 73-159.000.
Iyoda, Tetsuo; and Tamai, Masayoshi, to Fuji Xerox Co., Ltd. Method of charging jetted ink drops. 4,427,986, Cl. 346-1.100.
Izumi Denki Corporation: *See*—
Fujita, Teizo, 4,427,863, Cl. 200-306.000.
J. H. Fenner & Co. Ltd.: *See*—
Roberts, Michael J.; and Saul, Keith, 4,427,107, Cl. 198-844.000.

Jackel, Johann: *See*—
Maucher, Paul; Friedmann, Oswald; and Jackel, Johann, 4,426,915, Cl. 92-29.000.

Jackson, Wilbur C.: *See*—
Coleman, Donald J.; Jackson, Wilbur C.; Lube, Robert R.; and Spohr, Albert R., 4,426,777, Cl. 30-34.200.

Jacobellis, Alfonse A., to VSI Corporation. Resistance welded accumulator device. 4,427,028, Cl. 138-30.000.

Jacobsen, Finn, to Kamyr AB. Mixing device and method. 4,427,489, Cl. 162-57.000.

Jacques, James O.: *See*—
Applequist, Roy A.; Altobellis, Richard M.; Bagnell, Glade N.; Hoppe, Robert F.; Jacques, James O.; and Johnson, Terry G., 4,428,012, Cl. 360-106.000.

Jaeger, Rudolph: *See*—
Oesterle, Gerhard; Jaeger, Rudolph; Auer, Willibald; and Unfried, Hermann, 4,427,038, Cl. 139-449.000.

Jahn-Held, Wilhelm: *See*—
Lindorfer, Walter; Schulz, Walther; Wagner, Fritz; and Jahn-Held, Wilhelm, 4,427,528, Cl. 208-11.0LE.

Jakobsen, Kjell M., to Platmanufaktur A.B. Container for liquids, which are sensitive to light. 4,427,122, Cl. 215-1.00C.

James Mackie & Sons Ltd.: *See*—
Hill, Ashley, 4,427,037, Cl. 139-449.000.

Janauer, Gilbert E.: *See*—
Nudel, Ron; Janauer, Gilbert E.; Schrier, Eugene E.; and Figura, Ilona W., 4,427,796, Cl. 521-139.000.

Janick, Jules; and Wright, Daniel C., to Purdue Research Foundation. Method of non-agricultural production of jojoba wax. 4,426,808, Cl. 47-58.000.

Janome Sewing Machine Co. Ltd.: *See*—
Takenoya, Hideaki; Inamori, Mikio; and Makabe, Hachiro, 4,426,946, Cl. 112-266.100.

Japan Organo Co., Ltd.: *See*—
Miyahara, Akimitsu; Kanazawa, Toshihiko; Takahashi, Kokaji; Ushikubo, Hiroji; and Kawano, Kuniaki, 4,427,027, Cl. 137-576.000.

Japan Steel Works, Ltd.: *See*—
Miura, Tsuyoshi; Arakida, Yutaka; Kondo, Yoshikazu; and Ide, Tsuneyuki, 4,427,446, Cl. 75-244.000.

Jarniac, Roger, to Commissariat A l'Energie Atomique. Apparatus for the continuous adjustment of a jack piston stroke. 4,426,912, Cl. 91-39.000.

Jarosz, John M.; and Panas, William R., to S & C Electric Company. Brake and operation indicator for a high-voltage switch. 4,427,963, Cl. 337-6.000.

Jatczak, Chester F., to Timken Company, The. Composite bearing races and process for producing the same. 4,427,241, Cl. 308-207.00R.

Javitt, Norman B., to New York University. 26-Hydroxycholesterol and derivatives and analogs thereof in regulation of cholesterol accumulation in body tissue. 4,427,668, Cl. 424-238.000.

Jeannin, Serge: *See*—
Saby, Charles; Jeannin, Serge; and Perrier, Jean-Paul, 4,427,844, Cl. 174-188.000.

Jeblick, Werner: *See*—
Bruck, Dieter W.; Jeblick, Werner; Konigshofen, Heinrich; Roos, Ernst; and Ruetz, Lother, 4,427,817, Cl. 524-367.000.

Jeco Co., Ltd.: *See*—
Hirose, Hisashi; Arai, Hiroshi; Iiyama, Hiroshi; and Komiya, Hirokazu, 4,426,788, Cl. 33-395.000.

Jeffs, David G., to English Clays Lovering Pochin & Company Limited. Filled elastomer compositions. 4,427,452, Cl. 106-308.00Q.

Jensen, Niels D.; Nielsen, Kurt F.; and Komossa, Horst, to Grundfos A/S. Device for separating gas out of liquids. 4,427,421, Cl. 55-52.000.

Jentzsch, Arndt: *See*—
Kahlert, Peter; Schone, Helmut; Johne, Hans; Jentzsch, Arndt; Hefftler, Victor; Kuhnert, Werner; Karl, Rainer; Dittmann, Norbert; Fink, Heiner; and Preussger, Karl-Heinz, 4,427,193, Cl. 271-277.000.

Jessup, Peter: *See*—
Holstedt, Richard A.; and Jessup, Peter, 4,427,560, Cl. 252-42.700.

Jezbera, Val K., to Dataproducts Corporation. Compact band printer. 4,426,930, Cl. 101-93.140.

Jidosha Denki Kogyo Kabushiki Kaisha: *See*—
Sasaki, Michiaki; Yamamoto, Kiyokazu; and Hiratsuka, Ko, 4,426,978, Cl. 123-458.000.

Jobling, Alan: *See*—
England, Richard; Bowcott, John E. L.; Olds, John S.; and Jobling, Alan, 4,427,583, Cl. 260-123.700.

John Wyeth & Brother Ltd.: *See*—
White, Alan C.; and Hann, Michael M., 4,427,676, Cl. 424-246.000.

Johne, Hans: *See*—
Kahlert, Peter; Schone, Helmut; Johne, Hans; Jentzsch, Arndt; Hefftler, Victor; Kuhnert, Werner; Karl, Rainer; Dittmann, Norbert; Fink, Heiner; and Preussger, Karl-Heinz, 4,427,193, Cl. 271-277.000.

Johns, Samuel E., Jr., to Gearhart Industries Incorporated. Seismic well log display method and apparatus. 4,428,072, Cl. 367-69.000.

Johnson, Cary P., to Albany International Corp. Wet press felt for papermaking machines. 4,427,734, Cl. 428-234.000.

Johnson, David W. Streamlining apparatus. 4,427,229, Cl. 296-1.00S.

Johnson, Donald L.: *See*—
Kutnyak, Thomas A.; and Johnson, Donald L., 4,427,485, Cl. 156-429.000.

Johnson, Marvin M.; Nowack, Gerhard P.; and Kukes, Simon, to Phillips Petroleum Company. Catalyst. 4,427,575, Cl. 502-208.000.

Johnson Matthey Public Limited: *See*—
Day, Joseph G., 4,427,442, Cl. 75-10.00R.

Johnson, Paul A.: *See*—
Haville, George D.; and Johnson, Paul A., 4,427,972, Cl. 340-347.00P.

Johnson, Richard W. Grass and ditch mower. 4,426,829, Cl. 56-15.500.

Johnson, Ronald G.; and Barber, Monte D. Ozonizer system. 4,427,426, Cl. 55-162.000.

Johnson, Stephen G.: *See*—
Proud, Joseph M.; and Johnson, Stephen G., 4,427,921, Cl. 315-248.000.
Proud, Joseph M.; and Johnson, Stephen G., 4,427,922, Cl. 315-248.000.
Proud, Joseph M.; and Johnson, Stephen G., 4,427,923, Cl. 315-248.000.
Proud, Joseph M.; Lapatovich, Walter P.; and Johnson, Stephen G., 4,427,924, Cl. 315-248.000.

Johnson, Stuart J.: *See*—
Fransson, George E.; Johnson, Stuart J.; and Haug, Edward W., 4,427,324, Cl. 409-12.000.

Johnson, Terry G.: *See*—
Applequist, Roy A.; Altobellis, Richard M.; Bagnell, Glade N.; Hoppe, Robert F.; Jacques, James O.; and Johnson, Terry G., 4,428,012, Cl. 360-106.000.

Johnson, Thomas J.; and Thomas, Garth L., to Kysor Industrial Corporation. Air actuated vehicle temperature control system. 4,427,056, Cl. 165-42.000.

Johnston, Robert J.: *See*—
Layciak, Stephen G.; Johnston, Robert J.; and Colista, Dominic, 4,427,853, Cl. 200-50.00C.

Jones, Carol R.: *See*—
Grant, Barbara D.; and Jones, Carol R., 4,427,478, Cl. 156-275.500.

Jones, Geraint: *See*—
Dingle, John T.; Gordon, John L.; Jones, Geraint; Knight, Clive G.; and Lowe, John S., 4,427,649, Cl. 424-38.000.

Jones, Oscar F., Jr.: *See*—
Moore, Wayne T.; and Jones, Oscar F., Jr., 4,426,821, Cl. 52-646.000.

Jouwsma, Wijbren, to Bronkhorst High-Tech BV. Laminar flow element. 4,427,030, Cl. 138-42.000.

Juel, Leslie H.: *See*—
Hsu, Harry L.; Grindstaff, Lloyd I.; and Juel, Leslie H., 4,427,540, Cl. 208-131.000.

Julich, Werner: *See*—
Hintsch, Otto; and Julich, Werner, 4,427,035, Cl. 139-76.000.

Jungverdorben, Hermann-Josef: *See*—
Reinehr, Ulrich; Dross, Joachim; Herbertz, Toni; Jungverdorben, Hermann-Josef; and Burghartz, Hans K., 4,427,613, Cl. 264-206.000.

Jurges, Heinz-Henning. Mudguard. 4,427,208, Cl. 280-153.00R.

JWI Ltd.: *See*—
Beacom, Oliver J.; and Moger, Hugh A., 4,427,736, Cl. 428-288.000.

Kabushiki Kaisha Kawai Gakki Seisakusho: *See*—
Takauji, Kiyomi, 4,426,903, Cl. 84-1.220.

Kabushiki Kaisha Suwa Seikosha: *See*—
Fujiwara, Hitoshi; and Kodaira, Kozo, 4,427,314, Cl. 400-338.200.
Hosokawa, Minoru, 4,427,266, Cl. 350-333.000.

Kabushiki Kaisha Tokai Rika Denki Seisakusho: *See*—
Morikawa, Minoru, 4.426,864, Cl. 70-431.000.

Kabushiki Kaisha Toyoda Jidoshokki Seisakusho: *See*—
Yasui, Yoshiharu; Onoue, Keiji; Motobayashi, Kozo; and Yoshizawa, Toshio, 4,426,840, Cl. 57-301.000.
Yoshida, Kazunori; and Arakawa, Hiroshi, 4,427,036, Cl. 139-435.000.

Kabushiki Kaisha Toyota Chuo Kenkyusho: *See*—
Kogiso, Takeshi; and Ohkawa, Hiroshi, 4,427,418, Cl. 55-287.000.

Kahlert, Peter; Schone, Helmut; Johne, Hans; Jentzsch, Arndt; Hefftler, Victor; Kuhnert, Werner; Karl, Rainer; Dittmann, Norbert; Fink, Heiner; and Preussger, Karl-Heinz, to Veb Kombinat Polygraph "Werner Lamberz" Leipzig. Sheet gripping arrangement. 4,427,193, Cl. 271-277.000.

Kainuma, Hiroyuki; and Kimura, Tadayoshi, to Sawafuji Electric Co., Ltd. Vibrating compressor. 4,427,906, Cl. 310-27.000.

Kaji, Kiyokane: *See*—
Suzuki, Shosuke; Ito, Teruyoshi; Sakakibara, Yukio; Yamada, Takashi; Kubo, Fumiyoshi; Yoshimura, Kunimasa; Ugajin, Mitsuyuki; Kaji, Kiyokane; and Banno, Mitsuyuki, 4,426,975, Cl. 123-425.000.

Kakumoto, Hiromi; Ihara, Shinji; Iguchi, Yoji; and Miyata, Makoto, to Matsushita Electric Works, Ltd. Electric shaver. 4,426,776, Cl. 30-34.100.

Kakumoto, Michio, to Otsuka Pharmaceutical Factory, Inc. Method and apparatus for checking sealed containers for pinholes. 4,426,876, Cl. 73-49.300.

Kakumoto, Shigeru: *See*—
Shimada, Shigeru; and Kakumoto, Shigeru, 4,428,077, Cl. 382-9.000.

Kalal, Jaroslav: *See*—
Stol, Miroslav; Tolar, Miroslav; Adam, Milan; Cefelin, Pavel; and Kalal, Jaroslav, 4,427,808, Cl. 524-24.000.

Kalkowski, Dean J., to Mayflower Vapor Seal Corp. Floating deck support apparatus. 4,427,127, Cl. 220-218.000.

Kalmuk, Hans-Peter: *See*—
Kratel, Gunter; Katzer, Hans; and Kalmuk, Hans-Peter, 4,427,356, Cl. 428-195.000.
Kalpaxis, Alexander: *See*—
Pellegrino, Frank; and Kalpaxis, Alexander, 4,428,050, Cl. 364-414.000.
Kaltenbach & Voigt GmbH & Co.: *See*—
Hoffmeister, Jurgen; and Boeckh, Franz-Xaver, 4,427,382, Cl. 433-79.000.
Kalyanasundaram, Kuppuswamy: *See*—
Graetzel, Michael; Kalyanasundaram, Kuppuswamy; Duonghong, Dung; Neumann-Spallart, Michael; and Borgarello, Enrico, 4,427,749, Cl. 429-111.000.
Kamata, Isao: *See*—
Ohyama, Satoshi; and Kamata, Isao, 4,428,027, Cl. 361-333.000.
Kamerling, Marc A., to Optical Coating Laboratory, Inc. Mounting for optical antiglare panel and assembly including the same. 4,427,264, Cl. 350-276.00R.
Kaminbau Burger's Sohne: *See*—
Burger, Hans A.; and Gehrig, Wilhelm, 4,426,994, Cl. 126-121.000.
Kaminski, Elton G., to Stolle Corporation, The. Bolted joint connection. 4,427,318, Cl. 403-408.000.
Kammerud, John E.: *See*—
Hazel, Robert L.; and Kammerud, John E., 4,428,069, Cl. 365-215.000.
Hazel, Robert L.; and Kammerud, John E., 4,428,075, Cl. 369-45.000.
Kamoshita, Katsuzo: *See*—
Nagano, Eiki; Hashimoto, Shunichi; Yoshida, Ryo; Matsumoto, Hiroshi; and Kamoshita, Katsuzo, 4,427,438, Cl. 71-92.000.
Takemoto, Ichiki; Kamoshita, Katsuzo; Yoshida, Ryo; and Sumida, Seizo, 4,427,596, Cl. 260-453.0RW.
Kamuro, Takashi; Ohtsuga, Hisao; Kimura, Hiroshi; and Nakamura, Takeshi, to Tokyo Gas Co. Ltd.; and Ashimori Industry Co., Ltd. Method and apparatus for providing the inner surface of a pipe line with a tubular lining material. 4,427,480, Cl. 156-287.000.
Kamyr AB: *See*—
Jacobsen, Finn, 4,427,489, Cl. 162-57.000.
Kanade, Takeo; and Asada, Haruhiko, to Westinghouse Electric Corp. Non-contact visual proximity sensing apparatus. 4,427,880, Cl. 250-222.100.
Kanamori, Katsuo; Okawa, Hiroyuki; Mizuno, Takahide; Nakagawa, Fumihito; and Nagai, Isamu, to Mitsubishi Jidosha Kogyo Kabushiki Kaisha; and Mitsuboshi Belting Ltd. Toothed belt power transmission device. 4,427,403, Cl. 474-153.000.
Kanazawa, Toshihiko: *See*—
Miyahara, Akimitsu; Kanazawa, Toshihiko; Takahashi, Kokaji; Ushikubo, Hiroji; and Kawano, Kuniaki, 4,427,027, Cl. 137-576.000.
Kandybowski, Steven J.: *See*—
Bright, Edward J.; and Kandybowski, Steven J., 4,427,249, Cl. 339-17.0CF.
Kanegafuchi Kagaku Kogyo Kabushiki Kaisha: *See*—
Kato, Yasushi; and Furukawa, Hisao, 4,427,824, Cl. 524-858.000.
Kaneko, Takushi; and Wong, Henry S. L., to Bristol-Myers Company. Total synthesis of antitumor antibiotics BBM-2040A and BBM-2040B. 4,427,587, Cl. 260-239.30T.
Kaneko, Takushi; and Wong, Henry S. L., to Bristol-Myers Company. Process for conversion of oxotomaymycin to tomaymycin. 4,427,588, Cl. 260-239.30T.
Kanesaka, Hiroshi, to Kanesaka Technical Institute Ltd. Supercharged internal combustion engine. 4,426,985, Cl. 123-564.000.
Kanesaka Technical Institute Ltd.: *See*—
Kanesaka, Hiroshi, 4,426,985, Cl. 123-564.000.
Karami, Hamzeh; Haulait, Claude; and Cooper, Terence, to Colgate-Palmolive Company. Disposable panty and method. 4,427,408, Cl. 604-393.000.
Karanewsky, Donald S.; and Petrillo, Edward W., Jr., to E. R. Squibb & Sons, Inc. Phosphinylalkanoyl substituted imino acids and their use in hypotensive compositions. 4,427,665, Cl. 424-200.000.
Karanewsky, Donald S.: *See*—
Varma, Ravi K.; and Karanewsky, Donald S., 4,427,592, Cl. 260-397.450.
Karl Mayer Textilmaschinenfabrik GmbH: *See*—
Winter, Karl; Gille, Friedrich; and Lotz, Hans, 4,426,856, Cl. 66-212.000.
Karl, Rainer: *See*—
Kahlert, Peter; Schone, Helmut; Johne, Hans; Jentzsch, Arndt; Hefftler, Victor; Kuhnert, Werner; Karl, Rainer; Dittmann, Norbert; Fink, Heiner; and Preussger, Karl-Heinz, 4,427,193, Cl. 271-277.000.
Karlsson, Kurt, to Svenska Rotor Maskiner Aktiebolag. Rotary regenerative heat exchanger and method of operating same. 4,427,054, Cl. 165-1.000.
Karol, Frederick J.: *See*—
Miles, David L.; Karol, Frederick J.; and Goeke, George L., 4,427,573, Cl. 502-111.000.
Kasper, Alan H.: *See*—
Mathe, Istvan; and Kasper, Alan H., 4,427,251, Cl. 339-97.00P.
Kasuya, Michio: *See*—
Inoue, Shunzo; Nagasawa, Takeshi; Iwaya, Toshio; Kasuya, Michio; and Murata, Shinji, 4,426,883, Cl. 73-159.000.
Katakura, Masayuki: *See*—
Akagiri, Kenzo; Katakura, Masayuki; and Ookouchi, Motomi, 4,427,950, Cl. 330-149.000.
Kataoka, Kunitoshi: *See*—
Kimura, Toshio; Kataoka, Kunitoshi; Yamaji, Yoshiaki; Iwasaki, Hiromi; and Yamashita, Shinichi, 4,427,869, Cl. 219-93.000.
Kato, Masahiko; and Kikuchi, Tetsuro, to Nippon Soken, Inc. Seat belt tensioning device. 4,427,216, Cl. 280-806.000.
Kato, Yasushi; and Furukawa, Hisao, to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha. Method for dispersing pigments. 4,427,824, Cl. 524-858.000.
Katsuki, Kazuo; Shibaoka, Kazuo; Ohnishi, Shunji; and Miwa, Takao, to Nippon Sheet Glass Co., Ltd. Laminated panel. 4,427,743, Cl. 428-424.600.
Katz, George, to RCA Corporation. Method for improving the inspection of printed circuit boards. 4,427,496, Cl. 204-1.00T.
Katzer, Hans: *See*—
Kratel, Gunter; Katzer, Hans; and Kalmuk, Hans-Peter, 4,427,356, Cl. 428-195.000.
Kavage, William T.: *See*—
Monroe, Marvin E.; and Kavage, William T., 4,426,955, Cl. 119-51.00R.
Kawamura, Masanori: *See*—
Tanouchi, Tadao; Kawamura, Masanori; and Havashi, Masaki, 4,427,682, Cl. 424-263.000.
Kawano, Kuniaki: *See*—
Miyahara, Akimitsu; Kanazawa, Toshihiko; Takahashi, Kokaji; Ushikubo, Hiroji; and Kawano, Kuniaki, 4,427,027, Cl. 137-576.000.
Kawasaki Steel Corporation: *See*—
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Sumida, Norio; Oguchi, Yukio; Fujii, Tetsuya; Emi, Toshihiko; Fujimura, Toshio; Ueda, Arata; and Orito, Kenichi, 4,427,444, Cl. 75-93.00R.
Kawasaki, Yoshitaka: *See*—
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Kaye, Stanton; and Schreier, Curtis, to Kaye, Stanton. Title edge apparatus for serially produced collated copy. 4,427,290, Cl. 355-40.000.
Kazlauskas, Gasparas. Mounting fixture for an automatic welding apparatus. 4,427,868, Cl. 219-60.200.
Kearney & Trecker Corporation: *See*—
Kielma, Ervin J.; Schabowski, Albin J.; and Currer, John T., 4,427,325, Cl. 409-144.000.
Keeling, Harmon H.: *See*—
Hudspeth, Thomas; and Keeling, Harmon H., 4,427,953, Cl. 333-134.000.
Keeper Co., Ltd.: *See*—
Sugiyama, Masahiro, 4,427,206, Cl. 277-153.000.
Keller, Martin B., to Sandy Hill Corporation. Apparatus for applying a controlled layer of a saturant or a coating via a free-falling vertical curtain. 4,427,722, Cl. 427-420.000.
Keller, Ronald E., to Indiana Wire Die Company, Inc. Applicating die device. 4,426,954, Cl. 118-125.000.
Kelley, John R.; and Zurbrick, John R., to General Electric Company. Tool touch probe system and method of precision machining. 4,428,055, Cl. 364-474.000.
Kelly, James D.: *See*—
Brockas, Anthony; Abrahams, Roy; and Kelly, James D., 4,427,647, Cl. 424-1.100.
Kelso, Charles R.: *See*—
Taplin, Lael B.; Walter, Richard P.; Kelso, Charles R.; and Sisson, Albert E., 4,426,977, Cl. 123-446.000.
Kempter, Fritz E.; and Schupp, Eberhard, to BASF Aktiengesellschaft. Polyadduct/polycondensate which contains basic nitrogen groups, and its use. 4,427,514, Cl. 204-181.00C.
Kennecott Corporation: *See*—
Fitzgibbon, Jeremiah J., 4,427,068, Cl. 166-280.000.
Kenyon, Ralph E.: *See*—
Guhl, Thomas E.; Kenyon, Ralph E.; and Mozeke, Patricia A., 4,427,709, Cl. 426-578.000.
Kercher, Paul W.: *See*—
Charney, Andrew R.; Kercher, Paul W.; and Stone, Stanley A., 4,427,029, Cl. 138-30.000.
Kernforschungszentrum Karlsruhe GmbH: *See*—
Borgstedt, Hans U., 4,427,527, Cl. 208-8.00R.
Heilgeist, Michael, 4,427,503, Cl. 204-101.000.
Kerr-McGee Chemical Corporation: *See*—
Bowerman, P. David; and Lucid, Michael F., 4,427,640, Cl. 423-10.000.
Kesselman, David A. Tamper-proof fastener removal tool. 4,426,896, Cl. 81-441.000.
Ketcham, Lyman, to Simmonds Precision Products Inc. Apparatus and process of convoluting thermoplastic tubing without the use of wires. 4,427,616, Cl. 264-286.000.
Keyes Fibre Company: *See*—
Robbins, Gerald L.; and Vigue, Henry R., 4,427,730, Cl. 428-156.000.
Khitun, Georgy A.: *See*—
Toropov, Gennady A.; Shamenko, Stepan P.; Tsvirko, Georgy L.; Oleinichenko, Viktor G.; Khitun, Georgy A.; and Menyailenko, Anatoly I., 4,426,870, Cl. 72-118.000.
Khoe, Giok D.; and Velzel, Christiaan H. F., to U.S. Philips Corporation. Optical transmission system having reduced modal noise. 4,427,261, Cl. 350-96.200.

Kiamil, Sinan B.: *See*—
Fennimore, Jack; Potter, William D.; and Kiamil, Sinan B., 4,427,003, Cl. 128-90.000.
Kiefer, Mercedes; and Spector, George. Electrical facial massage apparatus. 4,427,001, Cl. 128-24.400.
Kielma, Ervin J.; Schabowski, Albin J.; and Currer, John T., to Kearney & Trecker Corporation. Multiple spindle toolhead. 4,427,325, Cl. 409-144.000.
Kierbow, Gerald C.; and Horinek, Herbert J., to Halliburton Company. Additive material metering system with weighing means. 4,427,133, Cl. 222-77.000.
Kihara, Kazuo; and Ikeda, Masashi, to Tokyo Shibaura Denki Kabushiki Kaisha. Semiconductor read only memory. 4,428,066, Cl. 365-96.000.
Kikuchi, Tetsuro: *See*—
Kato, Masahiko; and Kikuchi, Tetsuro, 4,427,216, Cl. 280-806.000.
Kikuchi, Yoshiki; and Ohmori, Takashi, to Fuji Xerox Co., Ltd. Thermorecording medium, means and process for producing and utilizing same. 4,427,985, Cl. 346-1.100.
Kikuchi, Yoshiki, to Fuji Xerox Co., Ltd. Magnetic latent image forming apparatus. 4,427,987, Cl. 346-74.400.
Kikugawa, Shozo: *See*—
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Killian, Gary L.: *See*—
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Kim, Han J.: *See*—
Wingert, Philip; Gaudino, Larry J.; and Kim, Han J., 4,427,625, Cl. 419-21.000.
Kimel, Eugene. Folding ruler accessory. 4,426,790, Cl. 33-458.000.
Kimura, Akira; and Abe, Toshiro, to Nissan Motor Co., Ltd. Vibration suppression system for diesel engine. 4,426,972, Cl. 123-378.000.
Kimura, Hiroshi: *See*—
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Kimura, Ryuji: *See*—
Kusuyanagi, Sampo; and Kimura, Ryuji, 4,427,561, Cl. 252-45.000.
Kimura, Tadayoshi: *See*—
Kainuma, Hiroyuki; and Kimura, Tadayoshi, 4,427,906, Cl. 310-27.000.
Kimura, Toshimitsu; and Ohmura, Yutaka, to Nissan Motor Co., Ltd. Shock absorbing assembly. 4,427,189, Cl. 267-139.000.
Kimura, Toshio; Kataoka, Kunitoshi; Yamaji, Yoshiaki; Iwasaki, Hiromi; and Yamashita, Shinichi, to Toyo Kogyo Co., Ltd. Method for manufacturing panel assemblies for automobiles. 4,427,869, Cl. 219-93.000.
Kincaid, Herbert: *See*—
Wolniak, Stanley C.; Kincaid, Herbert; Spencer, Elbert M.; and Brown, Ronald L., 4,427,852, Cl. 200-44.000.
Kindlimann, Lynn E., to Garrett Corporation, The. Nitridation and brazing of assemblies with titanium-containing iron based alloys. 4,427,461, Cl. 148-16.600.
Kinetico, Inc.: *See*—
Brown, Keith E.; and Buth, Jimmy D., 4,427,549, Cl. 210-662.000.
King, Colin V.: *See*—
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King, David R., to English Electric Valve Company Limited. Cooling arrangements. 4,428,025, Cl. 361-274.000.
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Kinsella, John E.; and Srinivasan, Damodaran, to Cornell Research Foundation, Inc. Method for separation and recovery of proteins and nucleic acids from nucleoproteins using water destructuring salts. 4,427,580, Cl. 260-112.00R.
Kinsella, Mary A.: *See*—
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Kinzie, James E. Unopened-door indicator. 4,427,975, Cl. 340-547.000.
Kirkpatrick, Charles R.: *See*—
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Kishimoto, Kazuo: *See*—
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Kishimoto, Kiyoharu: *See*—
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Kissei Pharmaceutical Co., Ltd.: *See*—
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Kitatani, Katuji; Sera, Hidefumi; Arai, Atsuaki; Ogawa, Masai; Ishigaki, Kunio; and Ogura, Haruo, to Fuji Photo Film Co., Ltd. Method of hardening gelatin. 4,427,768, Cl. 430-623.000.
Kiura, Yoshinori: *See*—
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Klaassen, Alan W.; and Bezman, Richard D., to Chevron Research Company. Promoter for the oxidation of SO_2 in an FCC process. 4,427,536, Cl. 208-113.000.
Klaren, Dick G., to Esmil BV. Apparatus and method for the concentration of a liquid by evaporation. 4,427,053, Cl. 165-1.000.
Klas, Kenneth H.; and Ansay, Norbert J., to Simplicity Manufacturing, Inc. Mower blade. 4,426,831, Cl. 56-295.000.
Klass, Larry S., to Avco Corporation. Delivery system for ball peening or forming apparatus. 4,426,866, Cl. 72-53.000.
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Klein, Max. Preparation of styrene-polymer and polyolefin micro-bits. 4,427,157, Cl. 241-15.000.
Kleinecke, John D.; Farag, Samir F.; and Little, Thomas R., to Siemens-Allis, Inc. Racking mechanism for motor control center. 4,427,854, Cl. 200-50.0AA.
Kleiner, Hans-Jerg, to Hoechst Aktiengesellschaft. Process for the preparation of vinylphosphonic acid dichloride and 2-chloroethanephosphonic acid dichloride. 4,427,602, Cl. 260-543.00P.
Klemarczyk, Philip T.: *See*—
Sprecker, Mark A.; Klemarczyk, Philip T.; and Belko, Robert P., 4,427,708, Cl. 426-538.000.
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Brieuc, Robert, 4,427,180, Cl. 254-106.000.
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Marshall, Francis G.; and Klimeck, Edward F., 4,427,124, Cl. 215-216.000.
Klimenko, Alexandr F.: *See*—
Petrov, Alexei K.; Akimenko, Vladimir B.; Zhuchin, Vladimir N.; Tsipunov, Alexei G.; Smirnova, Elena N.; Skornyakov, Jury N.; and Klimenko, Alexandr F., 4,427,626, Cl. 419-28.000.
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Berman, Max; Klimmek, William G.; and Konrad, Charles E., 4,427,930, Cl. 318-301.000.
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Kline, William L., 4,426,914, Cl. 91-487.000.
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Paschedag, Theodor, 4,427,407, Cl. 494-70.000.
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Lichtner, Emil, 4,426,963, Cl. 123-193.00H.
Klomp, Edward D.: *See*—
Cornelius, Walter; and Klomp, Edward D., 4,426,841, Cl. 60-39.230.
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Prochazka, Svante; and Klug, Frederic J., 4,427,785, Cl. 501-128.000.
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Knapp, Heinrich: *See*—
Greiner, Max; Grimm, Gerold; and Knapp, Heinrich, 4,426,988, Cl. 123-585.000.
Knecht, Klaus; Gebhard, Georg; and Rohr, Franz, to Kraftwerk Union Aktiengesellschaft. Alignment tool for spacers of nuclear reactor fuel assemblies. 4,427,622, Cl. 376-260.000.
Knight, Clive G.: *See*—
Dingle, John T.; Gordon, John L.; Jones, Geraint; Knight, Clive G.; and Lowe, John S., 4,427,649, Cl. 424-38.000.
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Olexa, Stephanie A.; Knight, Linda C.; and Budzynski, Andrei Z., 4,427,646, Cl. 424-1.100.
Knutsen, Einar. Method for making elongate cast construction on the sea. 4,426,949, Cl. 114-47.000.
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Tachibana, Noriki; Kobayashi, Morio; and Fujimori, Noboru, 4,427,764, Cl. 430-523.000.
Kobe, Thomas R. Apparatus and method for mounting roofing tile. 4,426,823, Cl. 52-748.000.
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Chen, Gilbert K.; Nyberg, Paul M.; and Buchholz, Matthew, 4,427,606, Cl. 261-111.000.
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Olasz, Sandor; Szalay, Denes; Kovacs, Jozsef; and Kocsis, Oliver, 4,426,948, Cl. 112-273.000.
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Fujiwara, Hitoshi; and Kodaira, Kozo, 4,427,314, Cl. 400-338.200.
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Yamaguchi, Hiroyasu; and Kodera, Yasuhiro, 4,427,949, Cl. 330-51.000.
Kodera, Yasuo; Ishii, Toshiaki; and Ohashi, Minoru, to Oriental Yeast Co. Ltd. Apparatus having automatic calibration for determining hydrogen peroxide concentration. 4,427,772, Cl. 435-27.000.
Koehler Manufacturing Company: *See*—
Guimond, Roy A.; Daly, Charles F.; and Gulliksen, John E., 4,428,039, Cl. 362-287.000.
Koepke, Gunther: *See*—
Hourticolon, Roland; Roth, Gerhard; Frenken, Hans; Schaffer, Helmut; and Koepke, Gunther, 4,426,757, Cl. 29-121.800.
Koetsier, Wicher T., to Exxon Research & Engineering Co. Composite zeolite. 4,427,577, Cl. 252-455.00Z.
Kofahl, William M., to Flying K Equipment System, Inc. Duplex hydraulic and air oil well pump. 4,427,348, Cl. 417-342.000.
Kogiso, Takeshi; and Ohkawa, Hiroshi, to Kabushiki Kaisha Toyota Chuo Kenkyusho. Device for collecting particulates in exhaust gases. 4,427,418, Cl. 55-287.000.
Kohle, Ulrich; Paffhausen, Hans; and Hartmann, Claus, to Pelikan Aktiengesellschaft. Multiuse pressure-type reproduction material. 4,427,739, Cl. 428-323.000.

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Stadelhofer, Jurgen; Franck, Heinz-Gerhard; and Kohler, Helmut, 4,427,526, Cl. 208-8.0LE.
Koizumi, Haruyuki: *See*—
Atsumi, Haruo; and Koizumi, Haruyuki, 4,427,856, Cl. 200-76.000.
Kojima, Masaharu, to Nifco Inc. Plastic fastener. 4,427,328, Cl. 411-508.000.
Kolff, Willem J., to University of Utah. Vacuum molding technique for manufacturing a ventricular assist device. 4,427,470, Cl. 156-73.100.
Kolve Sawchain Company: *See*—
Lemery, Douglas J., 4,426,900, Cl. 83-833.000.
Komeda, Masakatsu; and Fujiyama, Mamoru, to Zojirushi Vacuum Bottle Co., Ltd. Stainless steel thermos bottle. 4,427,123, Cl. 215-13.00R.
Komiya, Hirokazu: *See*—
Hirose, Hisashi; Arai, Hiroshi; Iiyama, Hiroshi; and Komiya, Hirokazu, 4,426,788, Cl. 33-395.000.
Komiyama, Choji: *See*—
Oishi, Kengo; Moriwaki, Masayoshi; and Komiyama, Choji, 4,427,166, Cl. 242-199.000.
Komori Printing Machinery Co., Ltd.: *See*—
Hoshi, Toshio, 4,427,405, Cl. 493-444.000.
Komossa, Horst: *See*—
Jensen, Niels D.; Nielsen, Kurt F.; and Komossa, Horst, 4,427,421, Cl. 55-52.000.
Komuro, Keiji; and Ueda, Akio, to Nippon Zeon Co. Ltd. Rubber materials having excellent grip on ice. 4,427,831, Cl. 525-211.000.
Kondo, Yoshikazu: *See*—
Miura, Tsuyoshi; Arakida, Yutaka; Kondo, Yoshikazu; and Ide, Tsuneyuki, 4,427,446, Cl. 75-244.000.
Kondziola, Joseph D., to General Motors Corporation. Dual-spool retractor for seat belts. 4,427,163, Cl. 242-107.000.
Konig, Klaus; Becker, Gernot; and Seifert, Peter, to Bayer Aktiengesellschaft. Solutions of oligo-urethane ethers in polyether polyols and their use in a process for the production of polyurethane foams. 4,427,798, Cl. 521-173.000.
Konigshofen, Heinrich: *See*—
Bruck, Dieter W.; Jeblick, Werner; Konigshofen, Heinrich; Roos, Ernst; and Ruetz, Lother, 4,427,817, Cl. 524-367.000.
Konishi, Takehisa: *See*—
Hitomi, Tomoge; Konishi, Takehisa; Ogushi, Tetsutaro; and Hatakeyama, Kazuaki, 4,427,499, Cl. 204-27.000.
Konishiroku Photo Industry Co., Ltd.: *See*—
Okaniwa, Kenichiro; Koyama, Mikio; and Kikugawa, Shozo, 4,427,632, Cl. 422-56.000.
Tachibana, Noriki; Kobayashi, Morio; and Fujimori, Noboru, 4,427,764, Cl. 430-523.000.
Takahashi, Toshiaki; and Itoh, Noburu, 4,427,762, Cl. 430-436.000.
Konrad, Charles E.: *See*—
Berman, Max; Klimmek, William G.; and Konrad, Charles E., 4,427,930, Cl. 318-301.000.
Kooijmans, Petrus G.; Raudenbusch, Werner T.; Van Steenis, Adrianus M. C.; Kunze, Wolfgang; and Seelen-Kruijssen, Josepha M. E., to Shell Oil Company. Thermosetting resinous binder compositions, their preparation and use as coating materials. 4,427,805, Cl. 523-417.000.
Kopel, LeRoy: *See*—
Finsterwald, P. Michael; and Kopel, LeRoy, 4,426,886, Cl. 73-633.000.
Koppensteiner, James V., to GTE Automatic Electric Labs. Inc. Printed wiring card stiffener bracket. 4,427,254, Cl. 339-108.00R.
Korex Company, The: *See*—
Porasik, Paul A., 4,427,417, Cl. 23-313.00R.
Korsell, Lars E. R., to Aktiebolaget Carl Munters. Device in an evaporative cooler. 4,427,607, Cl. 261-112.000.
Kosa, Yasunobu; and Shimizu, Shinji, to Hitachi, Ltd. Semiconductor memory device with peripheral circuits. 4,426,764, Cl. 29-571.000.
Kosemura, Kinjiro: *See*—
Yamamura, Shigeyuki; Kosemura, Kinjiro; Shima, Takao; and Hidaka, Norio, 4,427,991, Cl. 357-74.000.
Kostansek, Edward C., to Engelhard Corporation. Chalking-resistant, calcined kaolin clay pigment and method of making. 4,427,450, Cl. 106-288.00B.
Kotani, Genzaburou: *See*—
Suzuki, Sunao; and Kotani, Genzaburou, 4,427,947, Cl. 328-133.000.
Kotera, Takuro; Ohmukai, Yoshimi; Kawasaki, Yoshitaka; and Adachi, Kinichi, to Matsushita Electric Industrial Co., Ltd. Liquid fuel combustion apparatus. 4,427,365, Cl. 431-196.000.
Kotliar, Abraham M.: *See*—
Degrassi, Alfieri; Sacks, William; Sibilia, John P.; Kotliar, Abraham M.; and Mason, Charles D., 4,427,825, Cl. 525-56.000.
Kovacs, Jozsef: *See*—
Olasz, Sandor; Szalay, Denes; Kovacs, Jozsef; and Kocsis, Oliver, 4,426,948, Cl. 112-273.000.
Kowalski, Alexander; Vogel, Martin; and Blankenship, Robert M., to Rohm and Haas Company. Sequential heteropolymer dispersion and a particulate material obtainable therefrom, useful in coating compositions as a thickening and/or opacifying agent. 4,427,836, Cl. 525-301.000.
Koyabu, Yukio, to Sumitomo Heavy Industries, Ltd. Method of treating raw materials in an iron reduction process. 4,427,370, Cl. 432-5.000.
Koyabu, Yukio, to Sumitomo Heavy Industries, Ltd. Method of discharging material from a rotary furnace. 4,427,373, Cl. 432-14.000.
Koyama, Mikio: *See*—
Okaniwa, Kenichiro; Koyama, Mikio; and Kikugawa, Shozo, 4,427,632, Cl. 422-56.000.
Kozlowski, Stanley J. Accessory for wheeled floor jack. 4,427,178, Cl. 254-1.000.
Kraatz, Udo; Stetter, Jorg; Buchel, Karl H.; Frohberger, Paul-Ernst; and Brandes, Wilhelm, to Bayer Aktiengesellschaft. Combating fungi with substituted triazolylalkyl pyridyl ethers. 4,427,672, Cl. 424-245.000.
Kraft, Winfried; Froboese, Walter; Reinheimer, Guenter; and Wieber, Karl, to Ernst Leitz Wetzlar GmbH. Microscope frame. 4,427,270, Cl. 350-507.000.
Kraftwerk Union Aktiengesellschaft: *See*—
Knecht, Klaus; Gebhard, Georg; and Rohr, Franz, 4,427,622, Cl. 376-260.000.
Queiser, Horst; and Eckardt, Bernd, 4,427,893, Cl. 250-506.100.
Kramer, Wolfgang; Buchel, Karl H.; Brandes, Wilhelm; and Frohberger, Paul-Ernst, to Bayer Aktiengesellschaft. Azolylalkyl ketone and alcohol fungicides. 4,427,673, Cl. 424-245.000.
Krammel, Horst: *See*—
Weichenrieder, Albert; Krammel, Horst; and Rion, Claude, 4,427,215, Cl. 280-752.000.
Kratel, Gunter; Katzer, Hans; and Kalmuk, Hans-Peter, to Wacker Chemie GmbH. Bondable insulating plate. 4,427,356, Cl. 428-195.000.
Kress Corporation: *See*—
Medley, Jackson C., 4,427,097, Cl. 188-218.00R.
Krishnakumar, Suppayan M.: *See*—
Beck, Martin H.; Krishnakumar, Suppayan M.; and Harry, Ieuan L., 4,427,476, Cl. 156-199.000.
Kroll, Augustin, to Schwarzkopf Development Corporation. Clamping element for cutting tool. 4,427,322, Cl. 407-105.000.
Kromm, Alvin D., Jr.; and Moser, Rabin, to Xerox Corporation. Heat pressure fuser apparatus. 4,426,953, Cl. 118-60.000.
Kruger, Bradford E.; and Parr, John C., to International Telephone & Telegraph Corporation. Lossless annular rotary RF coupler. 4,427,983, Cl. 343-763.000.
Kruger, Wolfgang: *See*—
Huther, Werner; and Kruger, Wolfgang, 4,426,966, Cl. 123-286.000.
Krupp Corpoplast Maschinenbau GmbH: *See*—
Albrecht, Peter; Reymann, Wolfgang; and Vogel, Klaus, 4,427,360, Cl. 425-541.000.
Krupp Wilputte Corporation: *See*—
Naevestad, Roy, 4,427,494, Cl. 202-248.000.
Kubo, Fumiyoshi: *See*—
Suzuki, Shosuke; Ito, Teruyoshi; Sakakibara, Yukio; Yamada, Takashi; Kubo, Fumiyoshi; Yoshimura, Kunimasa; Ugajin, Mitsuyuki; Kaji, Kiyokane; and Banno, Mitsuyuki, 4,426,975, Cl. 123-425.000.
Kubo, Seitoku; Kuramochi, Koujiro; and Kyushima, Tatsuo, to Toyota Jidosha Kogyo Kabushiki Kaisha. Radially outward return spring for transmission brake. 4,426,891, Cl. 74-740.000.
Kubo, Seitoku; Kuramochi, Koujiro; and Kyushima, Tatsuo, to Toyota Jidosha Kogyo Kabushiki Kaisha. Torque transmission apparatus including direct coupling clutch and fluid-type torque converter. 4,427,098, Cl. 192-3.280.
Kubo, Yoshimi, to Sony Corporation. Mode selecting device for a video signal reproducing apparatus. 4,428,005, Cl. 360-10.300.
Kuboki, Shigeo; Hirayama, Takeshi; and Nakamura, Hideo, to Hitachi, Ltd. Electronic control apparatus for internal combustion engine. 4,428,051, Cl. 364-431.120.
Kubota Ltd.: *See*—
Isoda, Mitsumasa, 4,426,971, Cl. 123-367.000.
Nakano, Keiichi, 4,426,844, Cl. 60-295.000.
Umeda, Tatsutoshi; and Hashigaki, Yasunori, 4,426,964, Cl. 123-195.00A.
Kuboyama, Nobuyoshi. Heat generating apparatus and its process utilizing air circulation and convection. 4,426,793, Cl. 34-15.000.
Kubozono, Tatsuya: *See*—
Aizawa, Kaoru; Oishi, Yozo; and Kubozono, Tatsuya, 4,427,741, Cl. 428-332.000.
Kucharski, Lawrence, Jr.: *See*—
Gratzinger, Paul G.; and Kucharski, Lawrence, Jr., 4,427,966, Cl. 338-162.000.
Kuehnle, Manfred R.; and Cahill, Lysle D., to Coulter Systems Corporation. High speed imaging of electrophotographic film by fine beam scanning. 4,427,999, Cl. 358-300.000.
Kuehnle, Manfred R.; and Cahill, Lysle D., to Coulter Systems Corporation. High speed imaging of electrophotographic film by fine beam scanning. 4,428,000, Cl. 358-300.000.
Kufrin, Fred, to Badge A. Minit Ltd. Cutter for making paper discs. 4,426,781, Cl. 30-310.000.
Kuhle, Engelbert; Paulus, Wilfried; Klauke, Erich; and Genth, Hermann, to Bayer Aktiengesellschaft. Use of N,N-dimethyl-N'-p-tolyl-N'-dichlorofluoromethylthio-sulphamide for combating fungi which damage wood. 4,427,698, Cl. 424-321.000.
Kuhn S.A.: *See*—
Neuerburg, Horst, 4,426,828, Cl. 56-13.600.
Kuhnert, Werner: *See*—
Kahlert, Peter; Schone, Helmut; Johne, Hans; Jentzsch, Arndt; Hefftler, Victor; Kuhnert, Werner; Karl, Rainer; Dittmann, Norbert; Fink, Heiner; and Preussger, Karl-Heinz, 4,427,193, Cl. 271-277.000.
Kukes, Simon: *See*—
Johnson, Marvin M.; Nowack, Gerhard P.; and Kukes, Simon, 4,427,575, Cl. 502-208.000.

Kunze, Wolfgang: *See*—
Kooijmans, Petrus G.; Raudenbusch, Werner T.; Van Steenis, Adrianus M. C.; Kunze, Wolfgang; and Seelen-Kruijssen, Josepha M. E., 4,427,805, Cl. 523-417.000.

Kuo, Chyi J., to Boeing Company, The. Wireless audio passenger entertainment system (WAPES). 4,428,078, Cl. 455-3.000.

Kuo, Hong-Hsiang, to General Motors Corporation. Method and apparatus for disposal of thermoplastic waste in a fluidized bed reactor. 4,426,936, Cl. 110-245.000.

Kupfer, Hans; and Rudolph, Paul, to Metallgesellschaft Aktiengesellschaft. Reactor for gasifying solid fuels. 4,426,809, Cl. 48-86.00R.

Kupler Corporation: *See*—
Smith, Philip L.; and Caprio, Joseph R., 4,427,253, Cl. 339-98.000.

Kuramochi, Koujiro: *See*—
Kubo, Seitoku; Kuramochi, Koujiro; and Kyushima, Tatsuo, 4,426,891, Cl. 74-740.000.
Kubo, Seitoku; Kuramochi, Koujiro; and Kyushima, Tatsuo, 4,427,098, Cl. 192-3.280.

Kurata, Masashi: *See*—
Araki, Kenji; Kurata, Masashi; Yamana, Hideo; Suda, Toyoharu; Tayama, Katuhiko; and Watanabe, Masaji, 4,427,460, Cl. 148-12.00C.

Kuriu, Sadao: *See*—
Uchida, Koji; Yamada, Jun; Suzuki, Shigeyoshi; and Kuriu, Sadao, 4,427,754, Cl. 430-60.000.

Kuriyama, Shigeru; Nemoto, Kiyosi; and Horiuchi, Michimasa, to Hitachi, Ltd. Braking control apparatus for an electric motor operated vehicle. 4,427,928, Cl. 318-139.000.

Kurosawa, Yukio: *See*—
Abe, Nobuo; Sugawara, Hiroyuki; Kurosawa, Yukio; Wada, Akira; and Iwashita, Kiyoji, 4,427,857, Cl. 200-144.00B.

Kusayanagi, Sampo; and Kimura, Ryuji, to Nippon Mining Co., Ltd. Sulfur compound containing lubricant composition for use in Flon atmosphere. 4,427,561, Cl. 252-45.000.

Kushibiki, Takashi: *See*—
Otani, Junji; Okubo, Akira; and Kushibiki, Takashi, 4,426,962, Cl. 123-179.00H.

Kushmaul, Richard T.; and Webb, James E., to Docutel Corporation. Dispenser vacuum system. 4,427,192, Cl. 271-11.000.

Kutnyak, Thomas A.; and Johnson, Donald L., to Automation Industries, Inc. Ultrasonically bonded helically fabricated tubing and apparatus and method for making same. 4,427,485, Cl. 156-429.000.

Kyriakos, Constantinos S., to Bendix Corporation, The. Tracking filter for radio altimeter. 4,427,981, Cl. 343-12.00A.

Kysor Industrial Corporation: *See*—
Johnson, Thomas J.; and Thomas, Garth L., 4,427,056, Cl. 165-42.000.

Kyushima, Tatsuo: *See*—
Kubo, Seitoku; Kuramochi, Koujiro; and Kyushima, Tatsuo, 4,426,891, Cl. 74-740.000.
Kubo, Seitoku; Kuramochi, Koujiro; and Kyushima, Tatsuo, 4,427,098, Cl. 192-3.280.

L.B. (Plastics) Limited: *See*—
Litchfield, Leon G.; and Hardy, Terence, 4,427,245, Cl. 312-330.00R.

L. & C. Steinmuller GmbH: *See*—
Leikert, Klaus; and Rennert, Klaus-Dieter, 4,426,938, Cl. 110-347.000.

Labsystems OY: *See*—
Adlercreutz, Herman; Suovaniemi, Osmo A.; Partanen, Paul; and Suni, Jucea I., 4,427,769, Cl. 435-7.000.

Lack, Larry H. Ratchet wrench. 4,426,895, Cl. 81-57.390.

Lagace, Yves. Dental floss holder. 4,427,018, Cl. 132-91.000.

Lagakos, Nicholas; and Bucaro, Joseph A., to United States of America, Navy. Pressure insensitive optical fiber. 4,427,263, Cl. 350-96.330.

Lagally, Max G.: *See*—
Martin, Joe A.; and Lagally, Max G., 4,427,886, Cl. 250-310.000.

Laipply, Thomas C. Integral alcohol preparation device and method. 4,427,111, Cl. 206-210.000.

Laipply, Thomas C. One piece alcohol preparation device. 4,427,115, Cl. 206-484.000.

Lake, Geoffrey G. Single vane rotodynamic impeller. 4,427,336, Cl. 415-71.000.

Lamarche, Paul E., to Borg-Warner Corporation. Series damper dynamic lag system. 4,427,400, Cl. 464-64.000.

Lambert, Robert R. Proportioning air diffuser and system. 4,426,918, Cl. 98-40.00D.

Lambrix, Gregg F.: *See*—
Howell, George L.; and Lambrix, Gregg F., 4,427,114, Cl. 206-328.000.

La Nave, Gaetano. Electronic phase sequence indicator for three-phase electric systems. 4,427,939, Cl. 324-86.000.

Land, Edwin H., to Polaroid Corporation. Planar battery comprising a terminal plate having gas venting orifice covered with a layer of gas permeable material. 4,427,748, Cl. 429-82.000.

Landwide Foods, Inc.: *See*—
Morley, Robert G., 4,427,701, Cl. 426-36.000.

Lang, Walter; Blaha, Erich; Schmauder, Roland; and Muchel, Franz, to Carl-Zeiss-Stiftung. Method and apparatus for automatically compensating for rotation of images in articulated optical systems. 4,427,269, Cl. 350-500.000.

Lange, Peter M.; and Struver, Werner, to Bayer Aktiengesellschaft. Process for the preparation of bead polymers of uniform particle size by polymerization of microencapsulated monomer. 4,427,794, Cl. 521-28.000.

Langer Biomechanics Group, Inc., The: *See*—
Polchaninoff, Michael, 4,426,884, Cl. 73-172.000.

Lapatovich, Walter P.: *See*—
Proud, Joseph M.; Lapatovich, Walter P.; and Johnson, Stephen G., 4,427,924, Cl. 315-248.000.

Lapham, James M.: *See*—
Belanger, James A.; Wentworth, Robert J.; Calvin, Douglas J.; and Lapham, James M., 4,427,049, Cl. 160-199.000.

LaRat, Bernard: *See*—
Charpin, Jean; LaRat, Bernard; Marcel, Raymond; and Plurien, Pierre, 4,427,424, Cl. 55-158.000.

Larsen, Robert H.; and Pinzczek, Harold R., to Singer Company, The. Sewing machine thread guide with protective guard. 4,427,165, Cl. 242-157.000.

Larson, Andrew H.: *See*—
Mehta, Jitesh R.; and Larson, Andrew H., 4,427,629, Cl. 420-563.000.

Larsson, Nils. Adjustable shower head. 4,427,155, Cl. 239-460.000

LaRue, Kenneth. Bingo game with special marker. 4,427,198, Cl. 273-269.000.

Laska, Harry M.: *See*—
Gaines, George L., Jr.; Piacente, Patricia A.; Ward, William J., III; Smith, Peter C.; Gallivan, Timothy J.; and Laska, Harry M., 4,427,579, Cl. 252-639.000.

Latsch, Reinhard; and Bianchi, Valerio, to Robert Bosch GmbH. Method and apparatus for controlling the composition of the combustible mixture of an engine. 4,426,987, Cl. 123-571.000.

Lattimore, James: *See*—
Chisvette, Dominick; Lattimore, James; and Patterson, Donald M., 4,427,810, Cl. 524-88.000.

Lau, Philip Y., to Dow Chemical Company, The. Underground backfill for magnesium anodes. 4,427,517, Cl. 204-197.000.

Laufer, Helmut: *See*—
Greiner, Max; Laufer, Helmut; and Straubel, Max, 4,426,981, Cl. 123-488.000.

LaVia, Anthony L.: *See*—
Cilento, Rudolfo D.; Riffkin, Charles; and LaVia, Anthony L., 4,427,737, Cl. 428-315.700.

Lawrence, Jack: *See*—
Coles, Robert E.; Compton, Douglas R.; Lawrence, Jack; and Carpenter, William A., 4,427,108, Cl. 206-44.00R.

Lawson, John E., to Armco Inc. Method and apparatus for deep underwater well drilling and completion. 4,427,072, Cl. 166-345.000.

Layciak, Stephen G.; Johnston, Robert J.; and Colista, Dominic, to Westinghouse Electric Corp. Convertible momentary/maintained electric switch. 4,427,853, Cl. 200-50.00C.

Lear Siegler, Inc.: *See*—
Miller, Stewart F., 4,426,893, Cl. 76-1.000.

Le Berre, Serge: *See*—
Hareng, Michel; Hehlen, Robert; Le Berre, Serge; Leclerc, Pierre; Marcenac, Philippe; and Perbet, Jean-Noel, 4,427,997, Cl. 358-236.000.

Leclerc, Pierre: *See*—
Hareng, Michel; Hehlen, Robert; Le Berre, Serge; Leclerc, Pierre; Marcenac, Philippe; and Perbet, Jean-Noel, 4,427,997, Cl. 358-236.000.

Lecomte, Jacques: *See*—
Bouthors, Pierre; and Lecomte, Jacques, 4,427,156, Cl. 239-488.000.

Lederer, Edgar: *See*—
Le Francier, Pierre; Audibert, Francoise; Choay, Jean; Chedid, Louis; and Lederer, Edgar, 4,427,659, Cl. 424-177.000.

Lee, David L., to Stauffer Chemical Company. Imidoyl thioureas as used to control tobacco budworm. 4,427,699, Cl. 424-322.000.

Lee, Noel; and Choy, Andrew L., to Monster Cable Products, Inc. Electrical connector. 4,427,252, Cl. 339-89.00R.

Lee, William W. Y., to Hughes Aircraft Company. Method of fabricating high density high breakdown voltage CMOS devices. 4,426,766, Cl. 29-571.000.

Le Francier, Pierre; Audibert, Francoise; Choay, Jean; Chedid, Louis; and Lederer, Edgar, to Agence Nationale de Valorisation de la Recherche (ANVAR). Muramyl peptide substituted on a peptide nitrogen and medicaments containing the same. 4,427,659, Cl. 424-177.000.

LeGrand, Ferdinand; and Block, Seymour S., to University of Florida. Conversion of cellulosic fibers to mono-sugars and lignin. 4,427,584, Cl. 260-124.00R.

Lehman, David L.: *See*—
Collier, John C.; and Lehman, David L., 4,426,772, Cl. 29-742.000.

Lehner, Gerhard; and Stipek, Theodor, to Friedmann & Maier Aktiengesellschaft. Process for controlling the beginning of delivery of a fuel injection pump and device for performing said process. 4,426,982, Cl. 123-501.000.

Leifeld & Lemke Machinenfabrik & Co. GmbH: *See*—
Schepper, Manfred, 4,427,455, Cl. 134-22.180.

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Akers, John B.; Littler, Jane A.; and Peters, David C., 4,427,572, Cl. 252-369.000.
Clements, Anthony H., 4,427,566, Cl. 252-102.000.
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Prevot, Julien, 4,427,938, Cl. 324-78.00D.
Lin, Chester H., to S&C Electric Company. Contact assembly for a high-voltage circuit interrupter. 4,427,862, Cl. 200-252.000.
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Lin, Hung C.; and Wang, Ching D. Method of measuring time constant using a spectrum analyzer. 4,427,937, Cl. 324-77.00B.
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Littleton, Francis J. Thermal adjustment method and apparatus for rotating machines. 4,426,897, Cl. 83-37.000.
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Farmer, Robert M.; and Faucher, Brian R., 4,426,869, Cl. 72-104.000.
Livermore, David G. H.: *See*—
Ayres, Barry; O'Callaghan, Cynthia; Livermore, David G. H.; and Newall, Christopher E., 4,427,675, Cl. 424-246.000.
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Comploi, Georg; Heimgartner, Roland; Loacker, Artur; Huber, Kurt; and Wallimann, Hans, 4,426,941, Cl. 112-84.000.
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Neal, James W.; and Loersch, Joseph F., 4,426,867, Cl. 72-53.000.
Loewenstern, Kenneth M.: *See*—
Maltby, Frederick L.; Loewenstern, Kenneth M.; and Benning, Jack G., Jr., 4,428,026, Cl. 361-280.000.
Loftus Furnace Company: *See*—
Unks, Howard N., 4,427,371, Cl. 432-11.000.
Loftus, Peter J.; and Horvath, Stephen J. Method and apparatus for detecting abnormal thickness conditions such as folded and/or missing corners of moving sheets. 4,426,785, Cl. 33-147.00L.
Logan, Eugene T.: *See*—
Hawley, Laird V.; and Logan, Eugene T., 4,427,105, Cl. 198-632.000.
Lohmann, Joachim W.; Renner, Gunter; and Sauerteig, Wolfgang, to Agfa-Gevaert Aktiengesellschaft. Photographic recording material with a precursor compound for a yellow mask. 4,427,763, Cl. 430-504.000.
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Aucktor, Erich, 4,427,085, Cl. 180-70.00R.
Long, Howard W. Torch tip bore cleaning tool. 4,426,749, Cl. 15-93.00R.
Long, Kelso M.; and Pharr, Leonard, to Burner Systems International, Inc. Apparatus for punching holes in tubing. 4,426,899, Cl. 83-188.000.
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Lorenz, Joachim; and Grade, Reinhardt, to Ciba-Geigy Corporation. Use of iodoacetamide and amines for the control of harmful organisms, and agents for such control. 4,427,435, Cl. 71-67.000.
Lorenzo, John L.: *See*—
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Love, William. Combination of an outdoor swimming pool and adjustable roof structure. 4,426,744, Cl. 4-503.000.
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Maucher, Paul; Friedmann, Oswald; and Jackel, Johann, 4,426,915, Cl. 92-29.000.
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Luthy, Christoph; and Winternitz, Paul, to Hoffmann-La Roche Inc. Thiazoline carbamoyl-oximes. 4,427,687, Cl. 424-270.000.
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MacDonald, Paul M., to Dickran Babigian, Trustee. Drawer guide system. 4,427,246, Cl. 312-330.00R.
Macgrory, Wallace J.; and Frederick, George C., to EZY Wrap Products Pty. Limited. Plastics film dispenser. 4,427,144, Cl. 225-7.000.
Macioch, Michael T.: *See*—
Beebe, George W.; and Macioch, Michael T., 4,427,757, Cl. 430-264.000.
MacKay, Patrick W.; and Garcia, Gilberto G., to Hylsa, S.A. Rotary valve. 4,427,135, Cl. 222-368.000.
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MacKay, Robert K. Self-leveling sleeve insert for concrete passages. 4,427,173, Cl. 249-39.000.
Mackereth, Thomas C.; and Zebrowski, Tadeusz, to U.S. Philips Corporation. Film projection system. 4,427,273, Cl. 352-183.000.
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Madej, Edward A., to Robroy Industries. Compression coupling. 4,427,219, Cl. 285-249.000.
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Malcolme-Lawes, David J.; and Gifford, Lawrence A., to National Research Development Corporation. Detection and determination of species by fluorescence measurements. 4,427,892, Cl. 250-458.100.
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Maltby, Frederick L.; Loewenstern, Kenneth M.; and Benning, Jack G., Jr., to Drexelbrook Controls, Inc. Two layer probe. 4,428,026, Cl. 361-280.000.
Manea, Giuseppe, to Off. Mecc. F. lli Manea di Bortolino e Giuseppe Manea & C. s.n.c. Novel gluing machine. 4,427,487, Cl. 156-546.000.
Manger, Nina. Educational book-like toy. 4,427,390, Cl. 434-159.000.
Mann, Horace C., Jr.; and McGill, Kenneth E., to Tennessee Valley Authority. Clarification of black ammonium polyphosphate liquids—recycling of byproduct "tops". 4,427,432, Cl. 71-34.000.
Manriquez, Ralph F., to Nanometrics, Incorporated. Integrated circuit wafer transport mechanism. 4,427,332, Cl. 414-331.000.
Manson, Harry G., to IMC Magnetics Corp. Rotor for a stepper motor having a sheet metal support for the magnet. 4,427,911, Cl. 310-261.000.
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Myers, Richard D., 4,427,160, Cl. 242-55.19A.
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Margerum, J. David; and Miller, Leroy J., to Hughes Aircraft Company. Short length ester liquid crystal mixtures and process for making same. 4,427,569, Cl. 252-299.630.
Marier, Gaston: *See*—
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Marik, Victor F., to Form & Stake Lifts, Inc. Stake and form removal device. 4,427,182, Cl. 254-131.000.
Marlatt, George R.; and Allison, David K., to Westinghouse Electric Corp. Composite nozzle design for reactor fuel assembly. 4,427,624, Cl. 376-352.000.
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Marshall, Eric J. Sewing machines. 4,426,947, Cl. 112-272.000.
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Martenson, Donald S. Free standing stove. 4,426,992, Cl. 126-77.000.
Martin, Joe A.; and Lagally, Max G., to Wisconsin Alumni Research Foundation. Low voltage field emission electron gun. 4,427,886, Cl. 250-310.000.
Martin, Michael K., to Shell Oil Company. Dispersant-VI improver product. 4,427,834, Cl. 525-280.000.
Martin, Richard T., to Applied Magnetics Corporation. A method for sensing deposition of a thin film layer of a material. 4,427,711, Cl. 427-10.000.
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Bhatti, Mohinder S.; and Marzocchi, Alfred, 4,427,428, Cl. 65-1.000.
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Massachusetts Institute of Technology: *See*—
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Mathews, Ronald D.: *See*—
Catiller, Robert D.; Harris, Craig W.; and Mathews, Ronald D., 4,428,043, Cl. 364-200.000.
Matlock, Mark G.: *See*—
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Mato Maschinen- und Metallwarenfabrik Curt Matthaei GmbH & Co. KG: *See*—
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Matsumoto, Hiroshi; and Ogura, Tomoki, to Tokyo Shibaura Denki Kabushiki Kaisha. Copying machine with an automatic document feeder. 4,427,287, Cl. 355-14.0SH.
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Matsumoto, Masakazu: *See*—
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Matsushita Electric Industrial Co., Ltd.: *See*—
Kotera, Takuro; Ohmukai, Yoshimi; Kawasaki, Yoshitaka; and Adachi, Kinichi, 4,427,365, Cl. 431-196.000.
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Matsuura, Kazuo: *See*—
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Matthews, Hugh B., to Sperry Corporation. Gravity head reheat method. 4,426,849, Cl. 60-641.400.
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Matthewson, Randall W.; Benefiel, Earl H.; and Brudi, Ronald A., to Brudi Equipment, Inc. Side-loading container chassis storage rack. 4,427,117, Cl. 211-13.000.
Matthias, Jan H., to Hermann Hirsch Leder und Kunstoffwarenfabrik. Electronic wristwatch. 4,427,303, Cl. 368-282.000.
Mattila, Earl H. Sheet pile hoist device. 4,427,228, Cl. 294-83.00R.
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Maubois, Jean-Louis; Roger, Loic; Brule, Gerard; and Piot, Michel, to Institut National de la Recherche Agronomique. Total enzymatic hydrolysate from whey proteins and process of obtaining the same. 4,427,658, Cl. 424-177.000.
Maucher, Paul; Friedmann, Oswald; and Jackel, Johann, to Luk Lamellen und Kupplungsbau GmbH. Fluid-operated servomotor for actuation of clutches or the like. 4,426,915, Cl. 92-29.000.
Maucher, Paul; and Friedmann, Oswald, to Luk Lamellen und Kupplungsbau GmbH. Friction clutch unit. 4,427,101, Cl. 192-48.700.
Mauleon, Jean L.: *See*—
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Maurer, Helmut: *See*—
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May, Eric R., to Vickers Public Limited Company. Propulsion of ships. 4,427,393, Cl. 440-67.000.
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Mayflower Vapor Seal Corp.: *See*—
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Mayr, Heribert, to Deutsche Babcock Anlagen Aktiengesellschaft. Lifting equipment for an offshore construction. 4,427,319, Cl. 405-196.000.
McBride, Scott T. Flashlight having test leads and a second, remote, magnetically attachable rotatable lamp. 4,428,033, Cl. 362-183.000.
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MCIBS, Inc.: *See*—
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McKinney, Maurice E.; and Rudolph, Peter K. C., to Boeing Company, The. Variable camber leading edge mechanism with Krueger flap. 4,427,168, Cl. 244-214.000.
McKinstry, James E., to Nelson Manufacturing Company. Water volume indicator for an animal waterer. 4,426,956, Cl. 119-72.000.
McLachlan, Kenneth: *See*—
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McPherson, Allan B.: *See*—
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McWhorter, Edward M. Engine charge air temperature classifier. 4,426,967, Cl. 123-315.000.
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Nottke, James E., 4,427,006, Cl. 128-303.140.
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Mehoudar, Raphael, to Hydro-Plan Engineering Ltd. Irrigation system flushing valve. 4,427,174, Cl. 251-16.000.
Mehta, Jitesh R.; and Larson, Andrew H., to GNB Batteries Inc. Process for metal-enrichment of lead bullion. 4,427,629, Cl. 420-563.000.
Meier, Werner; and Hunkeler, Robert, to Sulzer Brothers Limited. Tray device for collecting and distributing liquid for a counter-current column. 4,427,605, Cl. 261-97.000.
Meilenner, Norbert J.; Sunderland, Richard T.; and Cook, John W., to Northern Telecom Limited. Apparatus for stranding wire. 4,426,837, Cl. 57-293.000.
Meilenner, Norbert J.: *See*—
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Meinan Machinery Works, Inc.: *See*—
Hasegawa, Katsuji, 4,427,043, Cl. 144-209.00R.
Meinardus, Elmond F., to Riviana Foods, Inc. Apparatus for removal of bran from rice and like cereal grains. 4,426,921, Cl. 99-519.000.
Memtel Corporation: *See*—
Heavener, Michael G., 4,427,055, Cl. 165-29.000.
Menyailenko, Anatoly I.: *See*—
Toropov, Gennady A.; Shamenko, Stepan P.; Tsvirko, Georgy L.; Oleinichenko, Viktor G.; Khitun, Georgy A.; and Menyailenko, Anatoly I., 4,426,870, Cl. 72-118.000.
Mercier, Bernard J.: *See*—
Engel, Joseph C.; and Mercier, Bernard J., 4,428,022, Cl. 361-96.000.
Mercil, LeRoy J. Boom suspension and lift assembly. 4,427,154, Cl. 239-161.000.
Merck & Co., Inc.: *See*—
Curley, Paul E.; and Hirschmann, Ralph F., 4,427,661, Cl. 424-177.000.
Mrozik, Helmut H., 4,427,663, Cl. 424-180.000.
Stapley, Edward O., 4,427,655, Cl. 424-115.000.
Merrien, Pierre A.: *See*—
Merrien, Pierre L.; and Merrien, Pierre A., 4,427,443, Cl. 75-68.00R.
Merrien, Pierre L.; and Merrien, Pierre A., to Etude et Developpement en Metallurgie. Process and apparatus for automating a vacuum degasification cycle for metal alloys. 4,427,443, Cl. 75-68.00R.
Messer, John A. Glue chipped glass and method. 4,427,729, Cl. 428-141.000.
Messina, Kathy J.: *See*—
Feinerman, Alan D.; Grimes, Donald L.; and Messina, Kathy J., 4,427,276, Cl. 354-412.000.
Metallgesellschaft Aktiengesellschaft: *See*—
Kupfer, Hans; and Rudolph, Paul, 4,426,809, Cl. 48-86.00R.
Rudolph, Paul; Reimert, Rainer; and Turna, Osman, 4,426,810, Cl. 48-197.00R.
Metallisations et Traitements Optiques M.T.O.: *See*—
Bel, Roger P.; Regnier, Michel M.; and Hascoet, Martial E., 4,427,014, Cl. 128-751.000.
Metcalf, Eric: *See*—
Skinner, Michael J.; Woollven, Jack; Metcalf, Eric; and Dorey, Howard A., 4,428,061, Cl. 364-728.000.
Metzger, Robert W.; Neathery, William D.; Reyes, Peter A.; Tisdale, Patrick R.; Covington, Cecil E.; and Broekhuizen, Willem, to Bell Helicopter Textron Inc. Soft inplane bearingless helicopter rotor. 4,427,340, Cl. 416-141.000.
Meyer, Clifford J., to Atlantic Richfield Company. Method and apparatus for gaseous cleaning of aluminum. 4,427,185, Cl. 266-220.000.
Miale, Joseph N.; and Chang, Clarence D., to Mobil Oil Corporation. Activation of high silica zeolites. 4,427,786, Cl. 502-61.000.
Miale, Joseph N.; and Chang, Clarence D., to Mobil Oil Corporation. Activation of zeolites. 4,427,787, Cl. 502-71.000.
Miale, Joseph N.; and Chang, Clarence D., to Mobil Oil Corporation. Activation of zeolites. 4,427,788, Cl. 502-71.000.
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Miale, Joseph N.; and Chang, Clarence D., to Mobil Oil Corporation. Activation of inorganic oxides. 4,427,791, Cl. 502-203.000.
Michaels, Paul A., to Bendix Corporation, The. Surface acoustic wave convolver having a horn central ray transit time compensating stub. 4,428,062, Cl. 364-821.000.
Michelet, Jacques, to Institut de Recherches de la Siderurgie Francaise. Tubular roll for continuous metal casting machines. 4,427,051, Cl. 164-448.000.
Micheron, Francois: *See*—
Broussoux, Dominique; Facoetti, Hugues; and Micheron, Francois, 4,427,609, Cl. 264-22.000.
Micro Graphic Concepts Inc.: *See*—
Edelstein, Alan; and White, Allan M., 4,427,279, Cl. 354-107.000.
Micro-Plate, Inc.: *See*—
Eisschun, Charles D., 4,427,019, Cl. 134-72.000.
Microcomputer Systems Corporation: *See*—
Gilovich, Paul A.; and Toreson, James S., 4,428,011, Cl. 360-102.000.
Microsize, Inc.: *See*—
Buchanan, Vernon G., 4,427,292, Cl. 355-54.000.
Microwave Development Labs: *See*—
Riblet, Gordon P.; and Hansson, Bertil E. R., 4,427,936, Cl. 324-58.00B.
Middleton, Andrew H., to British Gas Corporation. Lubricated bearing. 4,427,310, Cl. 384-415.000.
Middleton, Charles G.: *See*—
Cameron, Allan M., Jr.; and Middleton, Charles G., 4,427,484, Cl. 156-361.000.
Midland-Ross Corporation: *See*—
Decker, Maurice S., 4,427,220, Cl. 285-263.000.
Midyette, John, III: *See*—
Migliori, Albert, 4,427,897, Cl. 290-44.000.
Mieno, Fumiaki: *See*—
Iwashita, Hidemaro; Mieno, Fumiaki; Kiura, Yoshinori; and Hayashi, Kenichi, 4,427,637, Cl. 422-198.000.
Migliori, Albert, to Midyette, John, III; and Humphrey, John. Fixed pitch wind turbine system utilizing aerodynamic stall. 4,427,897, Cl. 290-44.000.
Miles, David L.; Karol, Frederick J.; and Goeke, George L., to Union Carbide Corporation. Polymerization catalyst, process for preparing, and use for ethylene polymerization. 4,427,573, Cl. 502-111.000.
Miles Laboratories, Inc.: *See*—
Chen, Shuenn-tzong; Sherwood, Mark J.; and Warchal, Mary E., 4,427,770, Cl. 435-14.000.
Milex Products, Incorporated: *See*—
Milgrom, Hymen, 4,427,477, Cl. 156-213.000.
Milgrom, Hymen, to Milex Products, Incorporated. Method for making a lipped vaginal contraceptive diaphragm. 4,427,477, Cl. 156-213.000.
Milholen, Harold J., to Pearne and Lacy Machine Co., Inc. Monorail jig box loader. 4,427,329, Cl. 414-68.000.
Millard, Ben: *See*—
Gray, Lorin S., III; Mattor, John A.; Millard, Ben; and Ward, Franklin J., 4,427,732, Cl. 428-172.000.
Miller, George W.; and Spector, George. Holder for spare toilet tissue. 4,427,159, Cl. 242-55.300.
Miller, John W., to Phelps Dodge Industries, Inc. Recirculation device. 4,427,374, Cl. 432-48.000.
Miller, Kenneth G., to Viridan Inc. Annular flow entrainment nebulizer. 4,427,004, Cl. 128-200.210.
Miller, Kenneth R.: *See*—
Howard, Norman C.; Miller, Kenneth R.; and Lussier, Matthew C., 4,427,623, Cl. 376-263.000.
Miller, Leroy J.: *See*—
Margerum, J. David; and Miller, Leroy J., 4,427,569, Cl. 252-299.630.
Miller, Robert J., to Decision Data Computer Corporation. Display station tilt mechanism. 4,427,243, Cl. 312-7.200.
Miller, Roscoe E. Enema apparata improvements relating to double contrast studies. 4,427,012, Cl. 128-654.000.
Miller, Stewart F., to Lear Siegler, Inc. High production serrator. 4,426,893, Cl. 76-1.000.
Miller, Wendell R.; and Martinez, Alphonso L., to Quantum Systems Corporation. Backwashing-type filtering apparatus with filter support grid of ring-like segments. 4,427,547, Cl. 210-411.000.
Milliken Research Corporation: *See*—
Kluger, Edward W., 4,427,597, Cl. 260-465.400.

Mills, Thomas G.: *See*—
Shahriary, Iradj; and Mills, Thomas G., 4,426,765, Cl. 29-571.000.
Millward, Gareth P., to Wharfedale Limited. Moving coil loudspeakers. 4,427,846, Cl. 179-115.5VC.
Minami, Junichi: *See*—
Terada, Masaki; Yoshimura, Akihiro; Hohsai, Kohichiro; and Minami, Junichi, 4,427,710, Cl. 426-634.000.
MiniScribe Corporation: *See*—
Applequist, Roy A.; Altobellis, Richard M.; Bagnell, Glade N.; Hoppe, Robert F.; Jacques, James O.; and Johnson, Terry G., 4,428,012, Cl. 360-106.000.
Minnesota Mining and Manufacturing Company: *See*—
Beebe, George W.; and Macioch, Michael T., 4,427,757, Cl. 430-264.000.
Wells, Edward S.; Ford, Spencer K.; Werner, Jack E.; and Lindsay, Erin J., 4,427,009, Cl. 128-400.000.
Mino, Mineo, to Matsushita Electric Industrial Co., Ltd. Magnetic tape system for optimally reproducing still and slow motion video pictures. 4,428,004, Cl. 360-10.200.
Minolta Camera Kabushiki Kaisha: *See*—
Ishida, Tokuji; and Hosomizu, Hiroshi, 4,427,278, Cl. 354-416.000.
Misaki, Hideo; Muramatsu, Eiji; Ishikawa, Hidehiko; and Matsuura, Kazuo, to Toyo Jozo Kabushiki Kaisha. Assay method for amylase activity and method of producing maltose dehydrogenase for use therein. 4,427,771, Cl. 435-22.000.
Mishli, Yuval: *See*—
Gerber, Heinz J.; Mishli, Yuval; Carulli, Vincent J.; and Cohen, Joseph H., 4,426,783, Cl. 33-1.00M.
Mitani, Akio; Matsui, Koichi; and Sakata, Hirotsugu, to Tokyo Shibaura Denki Kabushiki Kaisha. Air conditioning system. 4,426,853, Cl. 62-235.100.
Mitchell, Richard L.; Brundage, Richard B.; and Palmer, John A., to Emerson Electric Co. Power tool. 4,427,042, Cl. 144-1.00R.
Mitsubishi Chemical Industries Limited: *See*—
Ofuchi, Kunihiko; Oda, Koichiro; and Nakao, Kenichiro, 4,427,670, Cl. 424-241.000.
Oguri, Yasuo; Awata, Mitsuru; Saito, Junji; Inoue, Soichi; Andio, Tatsuo; and Abe, Mitsunobu, 4,427,611, Cl. 264-86.000.
Mitsubishi Denki Kabushiki Kaisha: *See*—
Miyake, Yoshikazu; and Ootsuka, Kenichi, 4,427,898, Cl. 307-9.000.
Suzuki, Sunao; and Kotani, Genzaburou, 4,427,947, Cl. 328-133.000.
Tabata, Youichiro; Ueguri, Shigeo; Mizuno, Takaji; and Mizuno, Masanori, 4,427,874, Cl. 219-130.510.
Tomuro, Yasuta, 4,427,901, Cl. 307-268.000.
Mitsubishi Gas Chemical Company, Inc.: *See*—
Sugio, Akitoshi; Masu, Masanobu; Okabe, Masao; Sasaki, Yukio; and Ishiyama, Kozo, 4,427,814, Cl. 524-126.000.
Mitsubishi Jidosha Kogyo Kabushiki Kaisha: *See*—
Kanamori, Katsuo; Okawa, Hiroyuki; Mizuno, Takahide; Nakagawa, Fumihito; and Nagai, Isamu, 4,427,403, Cl. 474-153.000.
Mitsubishi Paper Mills, Ltd.: *See*—
Uchida, Koji; Yamada, Jun; Suzuki, Shigeyoshi; and Kuriu, Sadao, 4,427,754, Cl. 430-60.000.
Mitsubishi Petrochemical Co., Ltd.: *See*—
Yukawa, Hideaki; Nara, Terukazu; and Takayama, Yoshihiro, 4,427,774, Cl. 435-115.000.
Mitsuboshi Belting Ltd.: *See*—
Kanamori, Katsuo; Okawa, Hiroyuki; Mizuno, Takahide; Nakagawa, Fumihito; and Nagai, Isamu, 4,427,403, Cl. 474-153.000.
Mitsuda, Yutaka: *See*—
Yagi, Norio; Chiba, Hisashi; Mitsuda, Yutaka; Sakano, Yasuaki; and Aikawa, Masaki, 4,427,832, Cl. 525-238.000.
Mitsui Petrochemical Industries Ltd.: *See*—
Inagaki, Hajime; and Wakumoto, Hiroshi, 4,427,823, Cl. 524-833.000.
Mittnacht, Hans: *See*—
Echte, Adolf; Gausepohl, Hermann; Hofmann, Hermann P.; and Mittnacht, Hans, 4,427,826, Cl. 525-53.000.
Miura, Tsuyoshi; Arakida, Yutaka; Kondo, Yoshikazu; and Ide, Tsuneyuki, to Japan Steel Works, Ltd.; and Toyo Kohan Co., Ltd. Corrosion-resistant and abrasive wear-resistant composite material for centrifugally cast linings. 4,427,446, Cl. 75-244.000.
Miwa, Kiyoshi: *See*—
Tsuchida, Takayasu; Miwa, Kiyoshi; Nakamori, Shigeru; and Momose, Haruo, 4,427,773, Cl. 435-110.000.
Miwa, Takao: *See*—
Katsuki, Kazuo; Shibaoka, Kazuo; Ohnishi, Shunji; and Miwa, Takao, 4,427,743, Cl. 428-424.600.
Miyagi, Hideo: *See*—
Nakano, Jiro; Miyagi, Hideo; and Ono, Hironobu, 4,426,973, Cl. 123-418.000.
Miyahara, Akimitsu; Kanazawa, Toshihiko; Takahashi, Kokaji; Ushikubo, Hiroji; and Kawano, Kuniaki, to Japan Organo Co., Ltd. Liquid storage tank. 4,427,027, Cl. 137-576.000.
Miyake, Yoshikazu; and Ootsuka, Kenichi, to Mitsubishi Denki Kabushiki Kaisha. Mobile power station apparatus. 4,427,898, Cl. 307-9.000.
Miyamoto, Ken: *See*—
Mochida, Haruo; and Miyamoto, Ken, 4,428,024, Cl. 361-172.000.
Miyata, Makoto: *See*—
Kakumoto, Hiromi; Ihara, Shinji; Iguchi, Yoji; and Miyata, Makoto, 4,426,776, Cl. 30-34.100.
Miyazaki, Ryuji, to Sharp Kabushiki Kaisha. Training mode operation in an electronic cash register. 4,428,049, Cl. 364-405.000.
Miyazaki, Yoshio; Nakaguchi, Osamu; and Hashimoto, Masashi, to Fujisawa Pharmaceutical Co., Ltd. Peptide, process for preparation thereof and use thereof. 4,427,581, Cl. 260-112.50R.
Mizuno, Hisao; Takagi, Shunichi; Nakahara, Kichio; and Nagae, Hiroyuki, to NGK Spark Plug Co., Ltd. Sparkplug with improved antifouling performance. 4,427,914, Cl. 313-130.000.
Mizuno, Masanori: *See*—
Tabata, Youichiro; Ueguri, Shigeo; Mizuno, Takaji; and Mizuno, Masanori, 4,427,874, Cl. 219-130.510.
Mizuno, Takahide: *See*—
Kanamori, Katsuo; Okawa, Hiroyuki; Mizuno, Takahide; Nakagawa, Fumihito; and Nagai, Isamu, 4,427,403, Cl. 474-153.000.
Mizuno, Takaji: *See*—
Tabata, Youichiro; Ueguri, Shigeo; Mizuno, Takaji; and Mizuno, Masanori, 4,427,874, Cl. 219-130.510.
Mizushima, Masashi; Ehata, Shigeru; Maruyama, Masanori; and Fukushima, Masakazu, to Hitachi, Ltd. Television camera tube with electrostatic focusing. 4,427,917, Cl. 313-389.000.
Mizutani, Hidemasa: *See*—
Suzuki, Takashi; Iizuka, Kiyoshi; Ohtaka, Keiji; and Mizutani, Hidemasa, 4,427,265, Cl. 350-321.000.
Mobil Oil Corporation: *See*—
Bowden, Edgar A., 4,427,935, Cl. 323-280.000.
Cook, Evin L., 4,427,066, Cl. 166-261.000.
Dotson, Billy J., 4,427,236, Cl. 299-5.000.
Horodysky, Andrew G.; and Braid, Milton, 4,427,562, Cl. 252-51.50A.
Humphries, Curtis L.; Schultz, Eddie F.; and Winkelman, Alan M., 4,426,879, Cl. 73-60.100.
Miale, Joseph N.; and Chang, Clarence D., 4,427,786, Cl. 502-61.000.
Miale, Joseph N.; and Chang, Clarence D., 4,427,787, Cl. 502-71.000.
Miale, Joseph N.; and Chang, Clarence D., 4,427,788, Cl. 502-71.000.
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Miale, Joseph N.; and Chang, Clarence D., 4,427,790, Cl. 502-71.000.
Miale, Joseph N.; and Chang, Clarence D., 4,427,791, Cl. 502-203.000.
Varghese, Philip, 4,427,532, Cl. 208-50.000.
Mochida, Haruo; and Miyamoto, Ken, to Nissan Motor Company, Ltd. Electronic door locking system for an automotive vehicle. 4,428,024, Cl. 361-172.000.
Moger, Hugh A.: *See*—
Beacom, Oliver J.; and Moger, Hugh A., 4,427,736, Cl. 428-288.000.
Mohr, Dieter; and Frass, Werner, to Hoechst Aktiengesellschaft. Hydrophilic coating of salt-type phosphorus or sulfur polymer on aluminum support materials for offset printing plates and process for manufacture and use with light sensitive layer thereon. 4,427,765, Cl. 430-525.000.
Mohr, Dieter, to Hoechst Aktiengesellschaft. Hydrophilic coating of salt type nitrogen polymer on aluminum support materials for offset printing plates and process for manufacture and use with light sensitive layer thereon. 4,427,766, Cl. 430-525.000.
Mola, Clark M.; Evans, Maurice L.; and Beringer, Richard D. Wheel rim buffer. 4,426,747, Cl. 15-21.00D.
Molnar, Bela, to Protective Plastics Limited. Manufacture of wrinkle-free flouroplastic laminated panels. 4,427,475, Cl. 156-163.000.
Momose, Haruo: *See*—
Tsuchida, Takayasu; Miwa, Kiyoshi; Nakamori, Shigeru; and Momose, Haruo, 4,427,773, Cl. 435-110.000.
Monroe, Marvin E.; and Kavage, William T., to Optek, Inc. Identification and animal feeding apparatus. 4,426,955, Cl. 119-51.00R.
Monsanto Company: *See*—
D'Amico, John J., 4,427,436, Cl. 71-88.000.
Monster Cable Products, Inc.: *See*—
Lee, Noel; and Choy, Andrew L., 4,427,252, Cl. 339-89.00R.
Montierth, Max R., to Corning Glass Works. High aspect ratio solid particulate filtering apparatus and method of filtering. 4,427,423, Cl. 55-97.000.
Moore, Charles L.; and Odom, Dennis J., to Olin Corporation. Mercury cathode electrolytic cell having protective shield. 4,427,519, Cl. 204-219.000.
Moore, Jerry L.; and Taylor, Attalee S., to AMP Incorporated. Stacking device for printed circuit boards. 4,427,316, Cl. 403-2.000.
Moore, Kenneth L. Scented candle. 4,427,366, Cl. 431-291.000.
Moore, Richard J. Universal drift and retriever. 4,427,061, Cl. 166-113.000.
Moore, Thomas C., to United States of America, National Aeronautics and Space Administration. Strain gage calibration. 4,426,874, Cl. 73-1.00B.
Moore, Wayne T.; and Jones, Oscar F., Jr. Triangular faced polyhedrals formed from end interconnected folded sheet trusses. 4,426,821, Cl. 52-646.000.
Moore, William P., to Frit Industries, Inc. Method of dedusting metal sulfate granules. 4,427,719, Cl. 427-205.000.
Moren, Rolf R.: *See*—
Norlander, Lars G.; Brask, Erik T.; and Moren, Rolf R., 4,427,307, Cl. 384-93.000.
Morgan, Orrin B. Clasp knife holder. 4,426,779, Cl. 30-138.000.
Mori, Kei. Illumination device. 4,428,031, Cl. 362-32.000.

Morikawa, Minoru, to Kabushiki Kaisha Tokai Rika Denki Seisakusho. Cylinder lock. 4,426,864, Cl. 70-431.000.
Morikubo, Kunio: *See*—
Nagazawa, Kohtaro; Satoh, Tsutomu; Morikubo, Kunio; Tanaka, Fujio; and Okuyama, Masaki, 4,427,760, Cl. 430-287.000.
Morimoto, Takeshi: *See*—
Oda, Yoshio; Morimoto, Takeshi; and Suzuki, Kohji, 4,427,523, Cl. 204-290.00R.
Morita, Norimasa. Bicycle frame. 4,427,209, Cl. 280-281.00R.
Moriuchi, Hisahiro: *See*—
Sakamoto, Takashi; Suto, Jinkichi; and Moriuchi, Hisahiro, 4,428,067, Cl. 365-104.000.
Moriwaki, Masayoshi: *See*—
Oishi, Kengo; Moriwaki, Masayoshi; and Komiyama, Choji, 4,427,166, Cl. 242-199.000.
Morley, Robert G., to Landwide Foods, Inc. Frozen yogurt product. 4,427,701, Cl. 426-36.000.
Moser, Rabin: *See*—
Kromm, Alvin D., Jr.; and Moser, Rabin, 4,426,953, Cl. 118-60.000.
Motobayashi, Kozo: *See*—
Yasui, Yoshiharu; Onoue, Keiji; Motobayashi, Kozo; and Yoshizawa, Toshio, 4,426,840, Cl. 57-301.000.
Motorola, Inc.: *See*—
Ellis, Ralph J.; Gurtler, Richard W.; and Sarma, Kalluri R., 4,427,638, Cl. 422-250.000.
Fennell, Robert D.; Weidler, Allen J.; and Bailey, David F., 4,427,980, Cl. 340-825.520.
Ritchie, Kim; and Smith, James N., 4,427,992, Cl. 357-78.000.
Moulton, Richard J.; and Neuner, John D., to Hexcel Corporation. Heterocyclic multifunctional amine adducts and curable compositions containing the same. 4,427,802, Cl. 523-222.000.
Mozeke, Patricia A.: *See*—
Guhl, Thomas E.; Kenyon, Ralph E.; and Mozeke, Patricia A., 4,427,709, Cl. 426-578.000.
Mrozik, Helmut H., to Merck & Co., Inc. 4''-Keto-and 4''-amino-4''-deoxy avermectin compounds and substituted amino derivatives thereof. 4,427,663, Cl. 424-180.000.
MTU Motoren-und Turbinen-Union: *See*—
Huther, Werner; and Kruger, Wolfgang, 4,426,966, Cl. 123-286.000.
Muchel, Franz: *See*—
Lang, Walter; Blaha, Erich; Schmauder, Roland; and Muchel, Franz, 4,427,269, Cl. 350-500.000.
Muddle, John R., to Poldenvale Ltd. Livestock weighing apparatus. 4,427,083, Cl. 177-132.000.
Mueller, Arthur L., to AMP Incorporated. Electrical connector. 4,427,258, Cl. 339-272.00R.
Mueller, Elisabeth R.: *See*—
Tonne, Peter; Mueller, Elisabeth R.; and Goerth, Helmut, 4,427,600, Cl. 260-505.00E.
Mues, Volker; and Behrenz, Wolfgang, to Bayer Aktiengesellschaft. 3,5-Dihalogeno-1,2-methylenedioxybenzene arthropodicide synergizing agents. 4,427,666, Cl. 424-200.000.
Muir, David M.: *See*—
Parker, Alan J.; and Muir, David M., 4,427,571, Cl. 252-364.000.
Mukoyama, Yoshiyuki: *See*—
Nishizawa, Hiroshi; Mukoyama, Yoshiyuki; and Hirai, Osamu, 4,427,822, Cl. 524-726.000.
Mulik, Edward J.: *See*—
Smith, Ray F.; and Mulik, Edward J., 4,427,481, Cl. 156-306.600.
Muller, Gerhard J., to Carl Zeiss Stiftung. Method and apparatus for molecular spectroscopy, particularly for the determination of products of metabolism. 4,427,889, Cl. 250-339.000.
Muller, Klaus; Maurer, Helmut; Rieger, Franz; and Linder, Ernst, to Robert Bosch GmbH. Apparatus for controlling the exhaust gas recirculation rate in an internal combustion engine. 4,426,986, Cl. 123-57.000.
Muller, Ortwin; and Vogel, Albrecht, to Carl-Zeiss-Stiftung. Electronic flashlight for ophthalmological examination instruments. 4,428,035, Cl. 362-224.000.
Muller, Wolfgang H. E.: *See*—
Hofmann, Peter; and Muller, Wolfgang H. E., 4,427,593, Cl. 260-410.90R.
Multinorm, B.V.: *See*—
Oosterling, Pieter A.; and van Staveren, Hendricus C., 4,426,827, Cl. 56-13.600.
Mumford, Eustace H.; and Perry, Jack I., to Owens-Illinois, Inc. Electronic control of a glass forming machine. 4,427,431, Cl. 65-163.000.
Munger, Stanley H.: *See*—
Gruetzmacher, Robert R.; and Munger, Stanley H., 4,427,759, Cl. 430-273.000.
Munshi, Mayank V., to Richardson-Vicks, Inc. Thixotropic compositions easily convertible to pourable liquids. 4,427,681, Cl. 424-260.000.
Murakami, Shuzo: *See*—
Furukawa, Nobuhiro; Inoue, Kenji; and Murakami, Shuzo, 4,427,751, Cl. 429-206.000.
Muramatsu, Eiji: *See*—
Misaki, Hideo; Muramatsu, Eiji; Ishikawa, Hidehiko; and Matsuura, Kazuo, 4,427,771, Cl. 435-22.000.
Murata, Masayoshi: *See*—
Takaya, Takao; Takasugi, Hisashi; Murata, Masayoshi; and Yoshioka, Akiteru, 4,427,677, Cl. 424-246.000.
Murata, Shinji: *See*—
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Murray, Andrew E.: *See*—
Seilly, Alec H.; and Murray, Andrew E., 4,426,983, Cl. 123-506.000.
Murray, John A., to Conger/Murray Systems, Inc. Method and apparatus for curing concrete products. 4,427,610, Cl. 264-82.000.
Murray, Robert J.; and Schofield, John, to U.S. Philips Corporation. Acoustic wave bandpass electrical filters. 4,427,956, Cl. 333-194.000.
Mutoh Industry Ltd.: *See*—
Nakaoki, Touru; and Uno, Hiroshi, 4,427,882, Cl. 250-231.0SE.
Myers, Richard D., to Marathon Products Corporation. Equalizer for tape tension. 4,427,160, Cl. 242-55.19A.
Nabeta, Teiichi: *See*—
Nishimura, Masao; Nabeta, Teiichi; and Fujiwara, Toshitaka, 4,426,852, Cl. 62-179.000.
Naevestad, Roy, to Krupp Wilputte Corporation. Chuck door for coke oven pusher side door and heat radiation shield. 4,427,494, Cl. 202-248.000.
Nagae, Hiroyuki: *See*—
Mizuno, Hisao; Takagi, Shunichi; Nakahara, Kichio; and Nagae, Hiroyuki, 4,427,914, Cl. 313-130.000.
Nagai, Isamu: *See*—
Kanamori, Katsuo; Okawa, Hiroyuki; Mizuno, Takahide; Nakagawa, Fumihito; and Nagai, Isamu, 4,427,403, Cl. 474-153.000.
Nagano, Eiki; Hashimoto, Shunichi; Yoshida, Ryo; Matsumoto, Hiroshi; and Kamoshita, Katsuzo, to Sumitomo Chemical Company, Limited. N-(2-Fluoro-4-halo-5-substituted phenyl) hydantoins. 4,427,438, Cl. 71-92.000.
Nagasawa, Takeshi: *See*—
Inoue, Shunzo; Nagasawa, Takeshi; Iwaya, Toshio; Kasuya, Michio; and Murata, Shinji, 4,426,883, Cl. 73-159.000.
Nagashima, Nao, to Canon Kabushiki Kaisha. Image forming apparatus. 4,427,288, Cl. 355-14.00R.
Nagata, Koji; Sato, Shiro; and Ogiso, Akio, to Sumitomo Light Metal Industries, Ltd. Coating composition for protecting inner surface of tubes in heat exchangers. 4,427,034, Cl. 138-145.000.
Nagazawa, Kohtaro; Satoh, Tsutomu; Morikubo, Kunio; Tanaka, Fujio; and Okuyama, Masaki, to Somar Manufacturing Co. Ltd. Photohardenable materials. 4,427,760, Cl. 430-287.000.
Naito, Akihiko, to Pioneer Electronic Corporation. Fail-safe CATV system center facility. 4,427,995, Cl. 358-86.000.
Nakagaki, Harushige: *See*—
Amada, Nobutaka; Nakagaki, Harushige; and Inoue, Shigeki, 4,427,951, Cl. 330-298.000.
Nakagawa, Fumihito: *See*—
Kanamori, Katsuo; Okawa, Hiroyuki; Mizuno, Takahide; Nakagawa, Fumihito; and Nagai, Isamu, 4,427,403, Cl. 474-153.000.
Nakagawa, Tokihalu: *See*—
Omiya, Shoji; Sunohara, Masaaki; Nakagawa, Tokihalu; Inagaki, Seiji; Yamawaki, Junnosuke; Nakamura, Nobuyuki; and Yanagisawa, Kaoru, 4,427,353, Cl. 425-151.000.
Nakagawa, Tooru: *See*—
Onuki, Keiichi; Nakagawa, Tooru; and Inoue, Tadashi, 4,426,968, Cl. 123-339.000.
Nakaguchi, Osamu: *See*—
Miyazaki, Yoshio; Nakaguchi, Osamu; and Hashimoto, Masashi, 4,427,581, Cl. 260-112.50R.
Nakahara, Kichio: *See*—
Mizuno, Hisao; Takagi, Shunichi; Nakahara, Kichio; and Nagae, Hiroyuki, 4,427,914, Cl. 313-130.000.
Nakajima, Fumito: *See*—
Arashi, Norio; Hishinuma, Yukio; Akimoto, Hidetoshi; Takahashi, Sadao; Nakajima, Fumito; and Gomi, Kenichi, 4,427,642, Cl. 423-244.000.
Nakamori, Shigeru: *See*—
Tsuchida, Takayasu; Miwa, Kiyoshi; Nakamori, Shigeru; and Momose, Haruo, 4,427,773, Cl. 435-110.000.
Nakamura, Hideo: *See*—
Kuboki, Shigeo; Hirayama, Takeshi; and Nakamura, Hideo, 4,428,051, Cl. 364-431.120.
Nakamura, Hiroshi; and Ichimura, Takeo, to Nippon Kogaku K.K. Fluophosphate optical glass. 4,427,784, Cl. 501-44.000.
Nakamura, Masayuki; and Tsuriya, Masaaki, to Sumitomo Durez Company, Ltd. Phenolic resin for refractory uses. 4,427,800, Cl. 523-145.000.
Nakamura, Nobuyuki: *See*—
Omiya, Shoji; Sunohara, Masaaki; Nakagawa, Tokihalu; Inagaki, Seiji; Yamawaki, Junnosuke; Nakamura, Nobuyuki; and Yanagisawa, Kaoru, 4,427,353, Cl. 425-151.000.
Nakamura, Ryuichi: *See*—
Yoshikawa, Seizi; and Nakamura, Ryuichi, 4,427,641, Cl. 423-18.000.
Nakamura, Takashi, to Sony Corporation. Apparatus for controlling electron beam of image pickup tube. 4,427,927, Cl. 315-383.000.
Nakamura, Takeshi: *See*—
Kamuro, Takashi; Ohtsuga, Hisao; Kimura, Hiroshi; and Nakamura, Takeshi, 4,427,480, Cl. 156-287.000.
Nakanishi, Toshihiro: *See*—
Toyoshima, Kumao; Hakura, Akira; Nakanishi, Toshihiro; and Yoshizumi, Hajime, 4,427,657, Cl. 424-177.000.
Nakano, Jiro; Miyagi, Hideo; and Ono, Hironobu, to Toyota Jidosha Kogyo Kabushiki Kaisha. Method of and apparatus for controlling the ignition timing of an internal combustion engine. 4,426,973, Cl. 123-418.000.

Nakano, Keiichi, to Kubota Ltd. Engine muffler of heat-exchanging type. 4,426,844, Cl. 60-295.000.
Nakao, Kenichiro: *See*—
Ofuchi, Kunihiko; Oda, Koichiro; and Nakao, Kenichiro, 4,427,670, Cl. 424-241.000.
Nakaoki, Touru; and Uno, Hiroshi, to Mutoh Industry Ltd. Digital measuring device. 4,427,882, Cl. 250-231.0SE.
Nakayama, Hiromichi, to Nifco, Inc. Rotor movement damping device. 4,426,752, Cl. 16-82.000.
Nalco Chemical Company: *See*—
Fong, Dodd W.; and Allain, Ronald J., 4,427,821, Cl. 524-555.000.
Namboodri, Chettoor G.: *See*—
Gregorian, Razmic S.; and Namboodri, Chettoor G., 4,427,409, Cl. 8-107.000.
Nanometrics, Incorporated: *See*—
Manriquez, Ralph F., 4,427,332, Cl. 414-331.000.
Nappholz, Tibor A.: *See*—
Spurrell, Roworth A. J.; Nappholz, Tibor A.; and Swift, Stephen J., 4,427,011, Cl. 128-419.0PG.
Nara, Terukazu: *See*—
Yukawa, Hideaki; Nara, Terukazu; and Takayama, Yoshihiro, 4,427,774, Cl. 435-115.000.
Nardo, Pietro. Apparatus for densitometric measurement of proteic fractions separated by electrophoresis. 4,427,294, Cl. 356-344.000.
Nash, Donald R., to Allied Corporation. Digital timing circuit for a rotating machine. 4,426,974, Cl. 123-418.000.
Nathenson, Richard D.: *See*—
Flick, Carl; and Nathenson, Richard D., 4,427,907, Cl. 310-52.000.
National Distillers and Chemical Corporation: *See*—
Magoulick, David M., 4,426,881, Cl. 73-146.800.
National Research Development Corporation: *See*—
Dingle, John T.; Gordon, John L.; Jones, Geraint; Knight, Clive G.; and Lowe, John S., 4,427,649, Cl. 424-38.000.
Malcolme-Lawes, David J.; and Gifford, Lawrence A., 4,427,892, Cl. 250-458.100.
National Semiconductor Corporation: *See*—
Harris, James M., 4,427,715, Cl. 427-96.000.
Natori, Takeshi: *See*—
Sunaoshi, Mitsugu; Tokoro, Koichi; Natori, Takeshi; and Yuki, Kojiro, 4,427,894, Cl. 250-515.100.
NCR Corporation: *See*—
Chari, Venu; Duke, Jack R.; and Gersten, Shimon, 4,428,046, Cl. 364-200.000.
Neal, James W.; and Loersch, Joseph F., to United Technologies Corporation. Method of peening airfoils and thin edged workpieces. 4,426,867, Cl. 72-53.000.
Neathery, William D.: *See*—
Metzger, Robert W.; Neathery, William D.; Reyes, Peter A.; Tisdale, Patrick R.; Covington, Cecil E.; and Broekhuizen, Willem, 4,427,340, Cl. 416-141.000.
Necchi Societa per Azioni: *See*—
Bianchi, Nereo, 4,426,944, Cl. 112-260.000.
Nederlandse Centrale Organisatie Voor Toegepast-Natuurwetenschappelijk Onderzoek: *See*—
Collet, Peter J., 4,426,842, Cl. 60-39.511.
Nei Canada Limited: *See*—
Winrow, Donald, 4,426,799, Cl. 40-449.000.
Nelson, Jerry J.: *See*—
Cardoza, Albert C.; Dawley, Von M.; Diaz, Edgardo C.; Edson, Michael E.; Nelson, Jerry J.; Peters, Robert D.; Wear, Dennis R.; and Wier, Daniel H., 4,428,037, Cl. 362-250.000.
Nelson Manufacturing Company: *See*—
McKinstry, James E., 4,426,956, Cl. 119-72.000.
Nelson, Robert L.: *See*—
Cairns, James A.; Nelson, Robert L.; and Woodhead, James L., 4,427,721, Cl. 427-376.500.
Nemoto, Kiyosi: *See*—
Kuriyama, Shigeru; Nemoto, Kiyosi; and Horiuchi, Michimasa, 4,427,928, Cl. 318-139.000.
Nesler, John J., to Hughes Aircraft Company. Overcurrent limiter circuit for switching regulator power supplies. 4,428,015, Cl. 361-18.000.
Nestenius, Nils O., to Styrteknik Olof Nestenius AB. Eye shank button attaching apparatus. 4,426,942, Cl. 112-108.000.
Nethaway, Douglas H.: *See*—
Gillette, Frank C., Jr.; Bryan, Ernest C.; and Nethaway, Douglas H., 4,427,304, Cl. 374-46.000.
Neuendorf, Hans-Cristoph: *See*—
Eckardt, Rudolf; and Neuendorf, Hans-Cristoph, 4,426,811, Cl. 51-101.00R.
Neuerburg, Horst, to Kuhn S.A. Mower having an improved cutter bar. 4,426,828, Cl. 56-13.600.
Neumann, Charles G., to Reynolds Products Inc. Ice maker diagnostic system. 4,426,851, Cl. 62-126.000.
Neumann-Spallart, Michael: *See*—
Graetzel, Michael; Kalyanasundaram, Kuppuswamy; Duonghong, Dung; Neumann-Spallart, Michael; and Borgarello, Enrico, 4,427,749, Cl. 429-111.000.
Neuner, John D.: *See*—
Moulton, Richard J.; and Neuner, John D., 4,427,802, Cl. 523-222.000.
New York Blood Center, Inc.: *See*—
Goldstein, Jack, 4,427,777, Cl. 435-240.000.
New York University: *See*—
Javitt, Norman B., 4,427,668, Cl. 424-238.000.
Newall, Christopher E.: *See*—
Ayres, Barry; O'Callaghan, Cynthia; Livermore, David G. H.; and Newall, Christopher E., 4,427,675, Cl. 424-246.000.
Newman, Edward; Nishikawa, A. Hirotoshi; Spiegel, Herbert E.; and Symington, Julia, to Hoffmann-La Roche Inc. Immunoassay of thymosin α_1. 4,427,783, Cl. 436-542.000.
Newman, Robert J.: *See*—
Dean, Robert R.; Mauleon, Jean L.; and Newman, Robert J., 4,427,537, Cl. 208-120.000.
NGK Insulators Ltd.: *See*—
Ishihara, Takeshi; Ishiwari, Michio; and Ishino, Shigeo, 4,427,843, Cl. 174-140.00S.
NGK Spark Plug Co., Ltd.: *See*—
Mizuno, Hisao; Takagi, Shunichi; Nakahara, Kichio; and Nagae, Hiroyuki, 4,427,914, Cl. 313-130.000.
Nishio, Kanemitsu; Takagi, Shunichi; and Suzuki, Yasuhiko, 4,427,915, Cl. 313-141.000.
Nguyen, Trung H.; Randall, John J., Jr.; and McPherson, Allan B., to Sprague Electric Company. AC Etching of aluminum capacitor foil. 4,427,506, Cl. 204-129.400.
Nicholson, George T.: *See*—
Bell, Frederic C., Sr.; Nicholson, George T.; Shade, Russell L., Jr.; and Skinner, David R., 4,427,058, Cl. 165-160.000.
Nickol, Friedrich W.: *See*—
Faust, Wolfgang; Nickol, Friedrich W.; and Baeger, Holm, 4,426,775, Cl. 29-846.000.
Nicolodi, Gerald L. Automatic saw swage. 4,426,894, Cl. 76-54.000.
Niederer, Kurt W., to Terrell Machine Company. Method for filtering particulates from a fluid. 4,427,422, Cl. 55-96.000.
Nielbock, Hans, to M.A.N. Maschinenfabrik Augsburg-Nurnberg Aktiengesellschaft. Device for making two axially parallel bores. 4,427,323, Cl. 408-42.000.
Nielsen, Kurt F.: *See*—
Jensen, Niels D.; Nielsen, Kurt F.; and Komossa, Horst, 4,427,421, Cl. 55-52.000.
Nielsen, Steven T., to Beckman Instruments, Inc. Sectional shaped liner for a centrifuge rotor. 4,427,406, Cl. 494-16.000.
Niethhammer, Dieter; Eggertsberger, Robert; and Wilmers, Gerhard, to Siemens Aktiengesellschaft. Interface device for coupling a system of time-division multiplexed channels to a data concentrator. 4,428,042, Cl. 364-200.000.
Nifco Inc.: *See*—
Kojima, Masaharu, 4,427,328, Cl. 411-508.000.
Nakayama, Hiromichi, 4,426,752, Cl. 16-82.000.
Nihon Plast Co., Ltd.: *See*—
Nishizima, Kazuyoshi, 4,426,951, Cl. 116-46.000.
Nikoden, Joseph, Jr., to Detroit-Armor Corporation. Case for securing valuables. 4,426,935, Cl. 109-79.000.
Niney, Claude: *See*—
Guerlet, Jean-Paul; and Niney, Claude, 4,427,627, Cl. 420-496.000.
Nippon Electric Co., Ltd.: *See*—
Sugimoto, Masunori, 4,427,903, Cl. 307-355.000.
Nippon Gakki Seizo Kabushiki Kaisha: *See*—
Okumura, Takatoshi; and Yamaoka, Shigemitsu, 4,426,902, Cl. 84-1.100.
Takamura, Masayuki, 4,427,746, Cl. 428-614.000.
Nippon Kinzoku Co., Ltd.: *See*—
Hitomi, Tomoge; Konishi, Takehisa; Ogushi, Tetsutaro; and Hatakeyama, Kazuaki, 4,427,499, Cl. 204-27.000.
Nippon Kogaku K.K.: *See*—
Nakamura, Hiroshi; and Ichimura, Takeo, 4,427,784, Cl. 501-44.000.
Nippon Kokan Kabushiki Kaisha: *See*—
Araki, Kenji; Kurata, Masashi; Yamana, Hideo; Suda, Toyoharu; Tayama, Katuhiko; and Watanabe, Masaji, 4,427,460, Cl. 148-12.00C.
Nishio, Hiroaki, 4,427,529, Cl. 208-11.00R.
Nippon Mining Co., Ltd.: *See*—
Araki, Kenji; Kurata, Masashi; Yamana, Hideo; Suda, Toyoharu; Tayama, Katuhiko; and Watanabe, Masaji, 4,427,460, Cl. 148-12.00C.
Kusayanagi, Sampo; and Kimura, Ryuji, 4,427,561, Cl. 252-45.000.
Nippon Sheet Glass Co., Ltd.: *See*—
Katsuki, Kazuo; Shibaoka, Kazuo; Ohnishi, Shunji; and Miwa, Takao, 4,427,743, Cl. 428-424.600.
Nippon Soken, Inc.: *See*—
Kato, Masahiko; and Kikuchi, Tetsuro, 4,427,216, Cl. 280-806.000.
Nippon Zeon Co. Ltd.: *See*—
Komuro, Keiji; and Ueda, Akio, 4,427,831, Cl. 525-211.000.
Nippondenso Co., Ltd.: *See*—
Nishimura, Masao; Nabeta, Teiichi; and Fujiwara, Toshitaka, 4,426,852, Cl. 62-179.000.
Suzuki, Shosuke; Ito, Teruyoshi; Sakakibara, Yukio; Yamada, Takashi; Kubo, Fumiyoshi; Yoshimura, Kunimasa; Ugajin, Mitsuyuki; Kaji, Kiyokane; and Banno, Mitsuyuki, 4,426,975, Cl. 123-425.000.
Nisenson, Jules: *See*—
Rude, Edward T.; Nisenson, Jules; and Waine, Martin, 4,427,100, Cl. 192-43.000.
Nishi, Hiroaki: *See*—
Oyama, Yoshiyuki; Matsuo, Yoshio; and Nishi, Hiroaki, 4,427,454, Cl. 127-44.000.
Nishikawa, A. Hirotoshi: *See*—
Newman, Edward; Nishikawa, A. Hirotoshi; Spiegel, Herbert E.; and Symington, Julia, 4,427,783, Cl. 436-542.000.

Nishimura, Masao; Nabeta, Teiichi; and Fujiwara, Toshitaka, to Nippondenso Co., Ltd. Air-conditioning control apparatus for automotive vehicles. 4,426,852, Cl. 62-179.000.
Nishimura, Tatsuo: *See*—
Numata, Mitsuo; Yamaoka, Masayoshi; Nishimura, Tatsuo; and Matsumoto, Norichika, 4,427,586, Cl. 260-239.00A.
Nishio, Hiroaki, to Nippon Kokan Kabushiki Kaisha. Distilling shale oil from oil shale. 4,427,529, Cl. 208-11.00R.
Nishio, Kanemitsu; Takagi, Shunichi; and Suzuki, Yasuhiko, to NGK Spark Plug Co. Ltd. Spark plug and the process for production thereof. 4,427,915, Cl. 313-141.000.
Nishiyama, Keizo, to Canon Kabushiki Kaisha. Measuring apparatus. 4,427,295, Cl. 356-371.000.
Nishizawa, Hiroshi; Mukoyama, Yoshiyuki; and Hirai, Osamu, to Hitachi Chemical Co., Ltd. Process for producing particulate polymer having imide groups. 4,427,822, Cl. 524-726.000.
Nishizawa, Jun-ichi, to Zaidan Hojin Handotai Kenkyu Shinkokai. Semiconductor photo-electric converter with insulated gate over p-n charge storage region. 4,427,990, Cl. 357-22.000.
Nishizima, Kazuyoshi, to Nihon Plast Co., Ltd. Turn signal cancellation apparatus for use with steering wheel and shaft assembly. 4,426,951, Cl. 116-46.000.
Nissan Motor Co., Ltd.: *See*—
Kimura, Akira; and Abe, Toshiro, 4,426,972, Cl. 123-378.000.
Kimura, Toshimitsu; and Ohmura, Yutaka, 4,427,189, Cl. 267-139.000.
Mochida, Haruo; and Miyamoto, Ken, 4,428,024, Cl. 361-172.000.
Sasaki, Michiaki; Yamamoto, Kiyokazu; and Hiratsuka, Ko, 4,426,978, Cl. 123-458.000.
Watanabe, Hiroo, 4,427,865, Cl. 219-10.410.
Yagisawa, Kenzi, 4,427,367, Cl. 431-354.000.
Nissei Plastic Industrial Co., Ltd.: *See*—
Omiya, Shoji; Sunohara, Masaaki; Nakagawa, Tokihalu; Inagaki, Seiji; Yamawaki, Junnosuke; Nakamura, Nobuyuki; and Yanagisawa, Kaoru, 4,427,353, Cl. 425-151.000.
Nissin Shokuhin Kabushiki Kaisha: *See*—
Terada, Masaki; Yoshimura, Akihiro; Hohsai, Kohichiro; and Minami, Junichi, 4,427,710, Cl. 426-634.000.
Nittetsu Mining Co., Ltd.: *See*—
Takesue, Morimasa; Otsuka, Hiroyasu; and Yanagihara, Hiroyuki, 4,427,372, Cl. 432-14.000.
Nitto Electric Industrial Co., Ltd.: *See*—
Aizawa, Kaoru; Oishi, Yozo; and Kubozono, Tatsuya, 4,427,741, Cl. 428-332.000.
Ikeyama, Norio; Sotoma, Nobuo; and Tamaru, Shusaku, 4,427,200, Cl. 277-3.000.
Niwa, Susumu: *See*—
Sando, Yoshikazu; Niwa, Susumu; and Ishidoshiro, Hiroshi, 4,426,746, Cl. 8-149.300.
NL Industries, Inc.: *See*—
House, Roy F.; and Hoover, Lonnie D., 4,427,556, Cl. 252-8.50A.
Noda, Hideo, to Shimano Industrial Company Limited. Fishing reel. 4,427,162, Cl. 242-84.21R.
Noguchi, Katsuya: *See*—
Aibe, Toshio; Tsutsumi, Yoshio; and Noguchi, Katsuya, 4,427,630, Cl. 422-4.000.
Nongbri, Govanon; Brandt, Susan M.; and Chervenak, Michael C., to Hydrocarbon Research, Inc. Selective operating conditions for high conversion of special petroleum feedstocks. 4,427,535, Cl. 208-112.000.
Nordeen, Erwin E., to Whirlpool Corporation. Vacuum cleaner nozzle with double brush. 4,426,751, Cl. 15-384.000.
Nordstrom, Barbara A.: *See*—
Nordstrom, John E., 4,426,825, Cl. 53-378.000.
Nordstrom, John E., to Nordstrom, Barbara A., a part interest. High speed wrapping machine. 4,426,825, Cl. 53-378.000.
Norlander, Lars G.; Brask, Erik T.; and Moren, Rolf R., to Sandvik Aktiebolag; and Aktiebolaget SKF. Rotary drill bit. 4,427,307, Cl. 384-93.000.
Normand, Gerard: *See*—
de Kermadec, Alain; Delanoe, Christian; and Normand, Gerard, 4,427,988, Cl. 346-155.000.
Northern Telecom Limited: *See*—
Garner, John N.; Roberge, Jean M.; and Meilenner, Norbert J., 4,426,838, Cl. 57-293.000.
Garner, John N.; and Roberge, Jean M., 4,426,839, Cl. 57-293.000.
Meilenner, Norbert J.; Sunderland, Richard T.; and Cook, John W., 4,426,837, Cl. 57-293.000.
Nottke, James E., to Medical Research Associates, Ltd. 1. Electrosurgical instruments. 4,427,006, Cl. 128-303.140.
Novak, Peter: *See*—
Briner, Emil; Novak, Peter; and Gasser, Hermann, 4,426,836, Cl. 57-267.000.
Nowack, Gerhard P.: *See*—
Johnson, Marvin M.; Nowack, Gerhard P.; and Kukes, Simon, 4,427,575, Cl. 502-208.000.
NRM Corporation: *See*—
Shichman, Daniel; and Enders, George E., 4,427,473, Cl. 156-130.000.
Nudel, Ron; Janauer, Gilbert E.; Schrier, Eugene E.; and Figura, Ilona W., to Research Foundation of the State University of New York. Water insoluble disinfectant composition. 4,427,796, Cl. 521-139.000.
Numata, Mitsuo; Yamaoka, Masayoshi; Nishimura, Tatsuo; and Matsumoto, Norichika, to Takeda Chemical Industries, Ltd. 2-Oxoazetidine derivatives and production thereof. 4,427,586, Cl. 260-239.00A.
Nunn, Donald E.; and Beveridge, Robert W., to C.R. Bard, Inc. Apparatus and method for measuring blood pressure. 4,427,013, Cl. 128-681.000.
Nussbaum, Theodore W.: *See*—
Riedesel, Roland G., Jr.; Nussbaum, Theodore W.; and Warren, Wayne F., 4,427,941, Cl. 324-323.000.
Nyberg, Paul M.: *See*—
Chen, Gilbert K.; Nyberg, Paul M.; and Buchholz, Matthew, 4,427,606, Cl. 261-111.000.
Obenshain, David N., to Westvaco Corporation. Method and apparatus for making ozone. 4,427,636, Cl. 422-186.070.
Oberhauser, Peter: *See*—
Sarin, Vinod K.; and Oberhauser, Peter, 4,427,082, Cl. 175-413.000.
O'Brien-Goins Engineering, Inc.: *See*—
O'Brien, Thomas B., 4,427,070, Cl. 166-317.000.
O'Brien, Thomas B., to O'Brien-Goins Engineering, Inc. Circulating and pressure equalizing sub. 4,427,070, Cl. 166-317.000.
O'Callaghan, Cynthia: *See*—
Ayres, Barry; O'Callaghan, Cynthia; Livermore, David G. H.; and Newall, Christopher E., 4,427,675, Cl. 424-246.000.
Oda, Goro, to Tokyo Shibaura Denki Kabushiki Kaisha. Toner recovery apparatus of electrostatic copying machine. 4,427,289, Cl. 355-15.000.
Oda, Koichiro: *See*—
Ofuchi, Kunihiko; Oda, Koichiro; and Nakao, Kenichiro, 4,427,670, Cl. 424-241.000.
Oda, Yoshio; Morimoto, Takeshi; and Suzuki, Kohji, to Asahi Glass Company Ltd. Cathode for electrolysis of alkali metal chloride. 4,427,523, Cl. 204-290.00R.
Odom, Dennis J.: *See*—
Moore, Charles L.; and Odom, Dennis J., 4,427,519, Cl. 204-219.000.
Oehler-Wyhlen-Lagertechnik AG: *See*—
Grebenstein, Hermann; and Speich, Jorge, 4,427,331, Cl. 414-277.000.
Oehme, Delbert R.: *See*—
Cloutier, Paul A.; Oehme, Delbert R.; and Stebbings, Ronald F., 4,427,943, Cl. 324-326.000.
Oellers, Walter; and Fischer, Friederich, to Trutzschler GmbH & Co. KG. Apparatus for opening and cleaning cotton waste. 4,426,753, Cl. 19-83.000.
Oesterle, Gerhard; Jaeger, Rudolph; Auer, Willibald; and Unfried, Hermann, to Aktiengesellschaft Adolf Saurer. Actuation device for the drive gear of a weft thread carrier of a shuttleless loom. 4,427,038, Cl. 139-449.000.
Off. Mecc. F. lli Manea di Bortolino e Giuseppe Manea & C. s.n.c.: *See*—
Manea, Giuseppe, 4,427,487, Cl. 156-546.000.
Ofuchi, Kunihiko; Oda, Koichiro; and Nakao, Kenichiro, to Mitsubishi Chemical Industries Limited. Skin preparation. 4,427,670, Cl. 424-241.000.
Ogawa, Masasi: *See*—
Kitatani, Katuji; Sera, Hidefumi; Arai, Atsuaki; Ogawa, Masasi; Ishigaki, Kunio; and Ogura, Haruo, 4,427,768, Cl. 430-623.000.
Ogiso, Akio: *See*—
Nagata, Koji; Sato, Shiro; and Ogiso, Akio, 4,427,034, Cl. 138-145.000.
Ogle Petroleum Inc. of California: *See*—
Hartman, George J., 4,427,235, Cl. 299-5.000.
Oguchi, Yukio: *See*—
Sumida, Norio; Oguchi, Yukio; Fujii, Tetsuya; Emi, Toshihiko; Fujimura, Toshio; Ueda, Arata; and Orito, Kenichi, 4,427,444, Cl. 75-93.00R.
Ogura, Haruo: *See*—
Kitatani, Katuji; Sera, Hidefumi; Arai, Atsuaki; Ogawa, Masasi; Ishigaki, Kunio; and Ogura, Haruo, 4,427,768, Cl. 430-623.000.
Ogura, Tomoki: *See*—
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Oguri, Yasuo; Awata, Mitsuru; Saito, Junji; Inoue, Soichi; Andio, Tatsuo; and Abe, Mitsunobu, to Mitsubishi Chemical Industries Ltd. Process for preparing calcium silicate shaped product. 4,427,611, Cl. 264-86.000.
Ogushi, Tetsutaro: *See*—
Hitomi, Tomoge; Konishi, Takehisa; Ogushi, Tetsutaro; and Hatakeyama, Kazuaki, 4,427,499, Cl. 204-27.000.
Ohara, Osamu; and Kishimoto, Kazuo, to Teijin Chemicals, Ltd. Polycarbonate resin composition. 4,427,829, Cl. 525-67.000.
O'Hare, Louis R. Solar diaphragm pump. 4,427,350, Cl. 417-379.000.
Ohashi, Minoru: *See*—
Kodera, Yasuo; Ishii, Toshiaki; and Ohashi, Minoru, 4,427,772, Cl. 435-27.000.
Ohata, Takashi. Storage device for processed foods. 4,426,923, Cl. 99-468.000.
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Kogiso, Takeshi; and Ohkawa, Hiroshi, 4,427,418, Cl. 55-287.000.
Ohlin, Claes: *See*—
Fehr, Werner; Ohlin, Claes; and Schabrun, Bruno, 4,427,858, Cl. 200-146.00R.
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Plys, Albert G.; Dresser, Thorpe; Ohlswager, Stanley; and Peterman, Lee G., 4,427,305, Cl. 374-45.000.

Ohmori, Takashi: *See*—
Kikuchi, Yoshiki; and Ohmori, Takashi, 4,427,985, Cl. 346-1.100.

Ohmori, Yasuo: *See*—
Tanahashi, Toshio; Ohnaka, Hidemi; and Ohmori, Yasuo, 4,426,976, Cl. 123-440.000.

Ohmukai, Yoshimi: *See*—
Kotera, Takuro; Ohmukai, Yoshimi; Kawasaki, Yoshitaka; and Adachi, Kinichi, 4,427,365, Cl. 431-196.000.

Ohmura, Yutaka: *See*—
Kimura, Toshimitsu; and Ohmura, Yutaka, 4,427,189, Cl. 267-139.000.

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Katsuki, Kazuo; Shibaoka, Kazuo; Ohnishi, Shunji; and Miwa, Takao, 4,427,743, Cl. 428-424.600.

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Suzuki, Takashi; Iizuka, Kiyoshi; Ohtaka, Keiji; and Mizutani, Hidemasa, 4,427,265, Cl. 350-321.000.

Ohtsuga, Hisao: *See*—
Kamuro, Takashi; Ohtsuga, Hisao; Kimura, Hiroshi; and Nakamura, Takeshi, 4,427,480, Cl. 156-287.000.

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Oishi, Yozo: *See*—
Aizawa, Kaoru; Oishi, Yozo; and Kubozono, Tatsuya, 4,427,741, Cl. 428-332.000.

Okabe, Masao: *See*—
Sugio, Akitoshi; Masu, Masanobu; Okabe, Masao; Sasaki, Yukio; and Ishiyama, Kozo, 4,427,814, Cl. 524-126.000.

Okaniwa, Kenichiro; Koyama, Mikio; and Kikugawa, Shozo, to Konishiroku Photo Industry Co., Ltd. Analytical element. 4,427,632, Cl. 422-56.000.

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Kanamori, Katsuo; Okawa, Hiroyuki; Mizuno, Takahide; Nakagawa, Fumihito; and Nagai, Isamu, 4,427,403, Cl. 474-153.000.

Okubo, Akira: *See*—
Otani, Junji; Okubo, Akira; and Kushibiki, Takashi, 4,426,962, Cl. 123-179.00H.

Okumura, Takatoshi; and Yamaoka, Shigemitsu, to Nippon Gakki Seizo Kabushiki Kaisha. Touch-responsive control apparatus for electronic musical instruments. 4,426,902, Cl. 84-1.100.

Okuyama, Masaki: *See*—
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Olander, Walter K.: *See*—
Banucci, Eugene G.; and Olander, Walter K., 4,427,594, Cl. 260-429.00C.

Olasz, Sandor; Szalay, Denes; Kovacs, Jozsef; and Kocsis, Oliver, to Csepel Muvek Jarmu es Konfekcioipari Gepgyara. Yarn detector for short seam sewing machines. 4,426,948, Cl. 112-273.000.

Oldham, Ronald C., to International Standard Electric Corporation. Armor wire splices. 4,427,262, Cl. 350-96.230.

Olds, John S.: *See*—
England, Richard; Bowcott, John E. L.; Olds, John S.; and Jobling, Alan, 4,427,583, Cl. 260-123.700.

Oleinichenko, Viktor G.: *See*—
Toropov, Gennady A.; Shamenko, Stepan P.; Tsvirko, Georgy L.; Oleinichenko, Viktor G.; Khitun, Georgy A.; and Menyailenko, Anatoly I., 4,426,870, Cl. 72-118.000.

Olexa, Stephanie A.; Knight, Linda C.; and Budzynski, Andrei Z., to Research Corporation. Use of radiolabeled peptide derived from crosslinked fibrin to locate thrombi in vivo. 4,427,646, Cl. 424-1.100.

Olin Corporation: *See*—
Moore, Charles L.; and Odom, Dennis J., 4,427,519, Cl. 204-219.000.

Olivier, Eric J. Wire line cutter apparatus. 4,427,059, Cl. 166-54.600.

Olympus Optical Company Limited: *See*—
Saitou, Shinichi; and Ida, Masatoshi, 4,428,009, Cl. 360-65.000.
Ueda, Yasuhiro, 4,427,000, Cl. 128-6.000.

Omiya, Shoji; Sunohara, Masaki; Nakagawa, Tokihalu; Inagaki, Seiji; Yamawaki, Junnosuke; Nakamura, Nobuyuki; and Yanagisawa, Kaoru, to Matsushita Electric Industrial Co., Ltd.; Teichiku Co., Ltd.; and Nissei Plastic Industrial Co., Ltd. Upright injection-compression pressing machine for the manufacture of information carrier discs. 4,427,353, Cl. 425-151.000.

Omron Tateisi Electronics Co.: *See*—
Atsumi, Haruo; and Koizumi, Haruyuki, 4,427,856, Cl. 200-76.000.
Sato, Ryuichi, 4,427,957, Cl. 335-19.000.

Ona, Isao; Ozaki, Masaru; and Taki, Yoichiro, to Toray Silicone Company, Ltd. Fiber-treating compositions comprising two organofunctional polysiloxanes. 4,427,815, Cl. 524-315.000.

Ono, Hironobu: *See*—
Nakano, Jiro; Miyagi, Hideo; and Ono, Hironobu, 4,426,973, Cl. 123-418.000.

Ono Pharmaceutical Co., Ltd.: *See*—
Tanouchi, Tadao; Kawamura, Masanori; and Havashi, Masaki, 4,427,682, Cl. 424-263.000.

Onoue, Keiji: *See*—
Yasui, Yoshiharu; Onoue, Keiji; Motobayashi, Kozo; and Yoshizawa, Toshio, 4,426,840, Cl. 57-301.000.

Onuki, Keiichi; Nakagawa, Tooru; and Inoue, Tadashi, to Hitachi, Ltd. Carburetor with means for compensation of idling revolution. 4,426,968, Cl. 123-339.000.

Ookouchi, Motomi: *See*—
Akagiri, Kenzo; Katakura, Masayuki; and Ookouchi, Motomi, 4,427,950, Cl. 330-149.000.

Oosterling, Pieter A.; and van Staveren, Hendricus C., to Multinorm, B.V. Mowing implement. 4,426,827, Cl. 56-13.600.

Ootsuka, Kenichi: *See*—
Miyake, Yoshikazu; and Ootsuka, Kenichi, 4,427,898, Cl. 307-9.000.

Optek, Inc.: *See*—
Monroe, Marvin E.; and Kavage, William T., 4,426,955, Cl. 119-51.00R.

Optical Coating Laboratory, Inc.: *See*—
Kamerling, Marc A., 4,427,264, Cl. 350-276.00R.

Orcutt, John W., to Texas Instruments Incorporated. Rolling diaphragm vacuum motor. 4,426,913, Cl. 91-376.00R.

Oregon Graduate Center: *See*—
Carlson, F. Paul; Blakemore, John S.; and Eror, Nicholas G., 4,427,457, Cl. 148-1.500.

Ores, Richard O. Treatment and prevention of infection with herpes simplex and related viruses. 4,427,684, Cl. 424-267.000.

Oriental Yeast Co. Ltd.: *See*—
Kodera, Yasuo; Ishii, Toshiaki; and Ohashi, Minoru, 4,427,772, Cl. 435-27.000.

Orita, Naoki; and Matsumoto, Toshiyuki, to Amada Engineering & Service Co. Method and apparatus for aligning axes of assisting gas nozzles with laser beam axes in laser processing machines. 4,427,873, Cl. 219-121.0LK.

Orito, Kenichi: *See*—
Sumida, Norio; Oguchi, Yukio; Fujii, Tetsuya; Emi, Toshihiko; Fujimura, Toshio; Ueda, Arata; and Orito, Kenichi, 4,427,444, Cl. 75-93.00R.

Orlowski, Jan A.; and Butler, David V., to Biendax-Werke R. Schneider GmbH & Co. Dental restoring material and a filler therefor. 4,427,799, Cl. 523-116.000.

Oroskar, Anil R.: *See*—
Crosby, Edwin J.; and Oroskar, Anil R., 4,427,541, Cl. 209-210.000.

Orter, Ralph H. Combination ash-tray. 4,427,016, Cl. 131-238.000.

Ortho Diagnostic Systems Inc.: *See*—
Reckel, Rudolph P.; and Harris, Joanne L., 4,427,779, Cl. 436-507.000.

Orton, Denis G., to Badische Corporation. Method of making colored short pile fabrics. 4,427,414, Cl. 8-480.000.

Osaka, Susumu; and Toda, Minoru, to RCA Corporation. Shutter construction. 4,427,048, Cl. 160-107.000.

Oster, Stanley M. Electrical outlet switch. 4,427,864, Cl. 200-330.000.

Ostrowsky, Efrem M., to Ethyl Products Company. Vented closure. 4,427,126, Cl. 215-307.000.

Otani, Junji; Okubo, Akira; and Kushibiki, Takashi, to Honda Giken Kogyo Kabushiki Kaisha. Structure for facilitating starting and warming of internal combustion engines. 4,426,962, Cl. 123-179.00H.

Otis Engineering Corporation: *See*—
Adams, James B., Jr., 4,427,175, Cl. 251-58.000.

Otsuka, Hiroyasu: *See*—
Takesue, Morimasa; Otsuka, Hiroyasu; and Yanagihara, Hiroyuki, 4,427,372, Cl. 432-14.000.

Otsuka Pharmaceutical Factory, Inc.: *See*—
Kakumoto, Michio, 4,426,876, Cl. 73-49.300.

Otsuka, Tsuneo: *See*—
Inoue, Kazuo; and Otsuka, Tsuneo, 4,427,087, Cl. 180-219.000.

Ottaviano, Gary W., to Ranpak Corp. Method and apparatus for making an air cell cushioning product. 4,427,474, Cl. 156-145.000.

Otto, Dennis L., to Atlantic Richfield Company. Unitized tapered roller bearing. 4,427,242, Cl. 308-187.200.

Otto, Robert W. Cymbal sizzler construction. 4,426,906, Cl. 84-402.000.

Owens-Corning Fiberglas Corporation: *See*—
Bhatti, Mohinder S.; and Marzocchi, Alfred, 4,427,428, Cl. 65-1.000.

Owens-Illinois, Inc.: *See*—
Friberg, Nelson, 4,426,898, Cl. 83-37.000.
Mumford, Eustace H.; and Perry, Jack I., 4,427,431, Cl. 65-163.000.

Oxenreider, Terry; and Eberle, William J., to General Battery Corporation. Method and apparatus for modifying the between the ribs dimension of a universally molded battery. 4,427,617, Cl. 264-296.000.

Oxley, Vincent C.: *See*—
Chen, Wen T.; and Oxley, Vincent C., 4,428,021, Cl. 361-94.000.

Oyama, Yoshiyuki; Matsuo, Yoshio; and Nishi, Hiroaki, to Riken Vitamin Oil Co., Ltd. Method for treating sugar solution. 4,427,454, Cl. 127-44.000.

Ozaki, Masaru: *See*—
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Ozeki, Jiro, to Slidex Corporation. Sheet for holding transparencies. 4,427,727, Cl. 428-116.000.

PA Management Consultants Limited: *See*—
Davey, Keith S. A., 4,427,714, Cl. 427-87.000.

Paffhausen, Hans: *See*—
Kohle, Ulrich; Paffhausen, Hans; and Hartmann, Claus, 4,427,739, Cl. 428-323.000.

Palmer, John A.: *See*—
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Pan, Peter N. Y., to Continental Can Company, Inc. Electrodynamic coating process. 4,427,712, Cl. 427-13.000.

Panas, William R.: *See—*
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Papuchon, Michel: *See—*
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Parham Industries, Inc.: *See—*
Hawley, Laird V.; and Logan, Eugene T., 4,427,105, Cl. 198-632.000.
Parker, Alan J.; and Muir, David M., to Anumin Pty. Ltd. Composition for stripping gold or silver from particulate materials. 4,427,571, Cl. 252-364.000.
Parker, Byron R.; and Stumpe, Thomas R., to Tennessee Valley Authority. Production of granular ammonium-polyphosphate with an inline reactor and drum granulator. 4,427,433, Cl. 71-34.000.
Parr, John C.: *See—*
Kruger, Bradford E.; and Parr, John C., 4,427,983, Cl. 343-763.000.
Partanen, Paul: *See—*
Adlercreutz, Herman; Suovaniemi, Osmo A.; Partanen, Paul; and Suni, Jueea I., 4,427,769, Cl. 435-7.000.
Paschedag, Theodor, to Klockner-Humboldt-Deutz AG. Centrifugal bowl separator. 4,427,407, Cl. 494-70.000.
Passavant-Werke AG & Co. KG: *See—*
Busse, Oswald; and Klesper, Hugo, 4,427,554, Cl. 210-777.000.
Patel, Harshad H., to Cummins Engine Company, Inc. Unitized oil cooler and filter assembly. 4,426,965, Cl. 123-196.0AB.
Patent-Treuhand-Gesellschaft fur Elektrische Gluhlampen mbH: *See—*
Rakitsch, Peter; and Bodmer, Albert, 4,428,038, Cl. 362-263.000.
Pattern-Scan, Inc.: *See—*
Schroeder, Kenneth; and Griffin, James, 4,428,056, Cl. 364-518.000.
Patterson, Donald M.: *See—*
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Paulus, Wilfried: *See—*
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Pauly, John A.; and Malinoski, John K., to Baxter Travenol Laboratories, Inc. Rotary electrical coupling for microwave heating apparatus. 4,427,866, Cl. 219-10.55B.
Pauquette, James J.: *See—*
Stark, Martin H.; Pisani, George V.; and Pauquette, James J., 4,427,724, Cl. 428-7.000.
Pawelski, Donald J. Carburetor. 4,427,604, Cl. 261-23.00A.
Payne, Reginald K.; and Trett, John. Monitoring and controlling lift positions. 4,427,095, Cl. 187-29.00R.
Peacock, Jon R.; and Schmidt, Robert L., to Beckman Instruments, Inc. Gas mixing apparatus for metastable transfer emission spectroscopy. 4,427,633, Cl. 422-83.000.
Pearne and Lacy Machine Co., Inc.: *See—*
Milholen, Harold J., 4,427,329, Cl. 414-68.000.
Pearson, Eugene W.; and Pedersen, Arthur L., to Canron Corporation. Deflection compensating means for press brakes and the like. 4,426,873, Cl. 72-389.000.
Pearson, Glenn A. Novel fire retardant compositions and methods. 4,427,745, Cl. 428-524.000.
Pedersen, Arthur L.: *See—*
Pearson, Eugene W.; and Pedersen, Arthur L., 4,426,873, Cl. 72-389.000.
Pedersen, S. Erik; Bremer, Noel J.; and Callahan, James L., to Standard Oil Company, The. Iron-phosphorus mixed oxide catalysts and process for their preparation. 4,427,792, Cl. 502-210.000.
Pedley, Jeffrey B.: *See—*
van Aken, Andreas B.; van Diepen, Petrus B. J.; and Pedley, Jeffrey B., 4,427,507, Cl. 204-151.000.
Peiffer, Dennis G.; Lundberg, Robert D.; and Walker, Thad O., to Exxon Research and Engineering Co. Interfacial viscosification of salt water systems utilizing sulfonated ionomers. 4,427,812, Cl. 524-115.000.
Pelikan Aktiengesellschaft: *See—*
Kohle, Ulrich; Paffhausen, Hans; and Hartmann, Claus, 4,427,739, Cl. 428-323.000.
Pellegrino, Frank; and Kalpaxis, Alexander. Tanning aid. 4,428,050, Cl. 364-414.000.
Pennell, William E.: *See—*
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Perbet, Jean-Noel: *See—*
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Duchesne, Gonzague L.; and Perrault, Guy, 4,427,468, Cl. 149-19.900.
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Saby, Charles; Jeannin, Serge; and Perrier, Jean-Paul, 4,427,844, Cl. 174-188.000.
Perry, Frederick J., to Westland Aircraft, Ltd. Helicopter rotor blade. 4,427,344, Cl. 416-223.00R.
Perry, Jack I.: *See—*
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Peterman, Lee G.: *See—*
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Peters, David C.: *See—*
Akers, John B.; Littler, Jane A.; and Peters, David C., 4,427,572, Cl. 252-369.000.
Peters, Douglas A. Leg rest. 4,427,234, Cl. 297-439.000.
Peters, Robert D.: *See—*
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Petersen, Richard W., to Augat Inc. Magnetic bubble memory socket. 4,427,247, Cl. 339-14.00R.
Peterson, Carl W. Concrete forming system and method of using it. 4,427,619, Cl. 264-333.000.
Peterson, John G., to FMC Corporation. Steerable drive axle with large cramp angle. 4,427,089, Cl. 180-253.000.
Petkovic-Luton, Ruzica: *See—*
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Petrov, Alexei K.; Akimenko, Vladimir B.; Zhuchin, Vladimir N.; Tsipunov, Alexei G.; Smirnova, Elena N.; Skornyakov, Jury N.; and Klimenko, Alexandr F. Method of making products from powders of tool steels. 4,427,626, Cl. 419-28.000.
Petrovich, Radomir: *See—*
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Phillips, M. K.; and Hayes, Cecil, to W. M. Still & Sons Limited. Coffee and tea making or brewing apparatus. 4,426,920, Cl. 99-307.000.
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Fore, Sharon R., 4,427,553, Cl. 210-743.000.
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Pieper, Werner: *See—*
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Pierpoint, Edward K., to Imperial Chemical Industries PLC. Catalysts. 4,427,574, Cl. 502-154.000.
Piggott, Michael R. Controlled matrix contraction composites. 4,427,735, Cl. 428-283.000.
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Bosse, Thomas W., 4,427,286, Cl. 355-3.00R.
Coppola, Vincent G.; and Lorenzo, John L., 4,427,969, Cl. 340-347.0AD.
Dannatt, Hugh S. L., 4,427,284, Cl. 355-1.000.
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Platmanufaktur A.B.: *See*—
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Platzer, Stephan J., to American Hoechst Corporation. Method for producing an aluminum support useful for lithography. 4,427,500, Cl. 204-33.000.

Plough, Irving L.; Puryear, David B.; and Turner, Charles R., to Pigott Enterprises. Log cestering device. 4,427,044, Cl. 144-356.000.

Plurien, Pierre: *See*—
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Plys, Albert G.; Dresser, Thorpe; Ohlswager, Stanley; and Peterman, Lee G., to Atlantic Richfield Company. Analyzer for distillable materials. 4,427,305, Cl. 374-45.000.

Pochter, Keith A., to Argyle Management Company. Interior covering material for a greenhouse. 4,426,812, Cl. 52-22.000.

Polaroid Corporation: *See*—
Feinerman, Alan D.; Grimes, Donald L.; and Messina, Kathy J., 4,427,276, Cl. 354-412.000.
Green, Lawrence E.; and Wareham, Richard R., 4,427,486, Cl. 156-517.000.
Land, Edwin H., 4,427,748, Cl. 429-82.000.

Polchaninoff, Michael, to Langer Biomechanics Group, Inc., The. Flexible force sensor. 4,426,884, Cl. 73-172.000.

Poldenvale Ltd.: *See*—
Muddle, John R., 4,427,083, Cl. 177-132.000.

Poll, Martin; and Covi, Christian, to D. Swarovski & Co. Small decorative plates. 4,427,733, Cl. 428-200.000.

Poitto, Esko K.: *See*—
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Pommer, Ernst-Heinrich: *See*—
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Kahlert, Peter; Schone, Helmut; Johne, Hans; Jentzsch, Arndt; Hefftler, Victor; Kuhnert, Werner; Karl, Rainer; Dittmann, Norbert; Fink, Heiner; and Preussger, Karl-Heinz, 4,427,193, Cl. 271-277.000.

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Crosby, Edward L., Jr., 4,426,875, Cl. 73-12.000.
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Reed, Samuel F.; and Hundermark, David L., to Rohm and Haas Company. Vinylbenzyl alcohol polymer beads and thermally crosslinked derivatives thereof. 4,427,793, Cl. 521-32.000.
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Reinehr, Ulrich; Dross, Joachim; Herbertz, Toni; Jungverdorben, Hermann-Josef; and Burghartz, Hans K., to Bayer Aktiengesellschaft. Continuous process for the production of filaments or fibers from difficultly soluble synthetic polymers. 4,427,613, Cl. 264-206.000.
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Reverberi, Leo. Water-proof garment horizontally foldable. 4,426,740, Cl. 2-84.000.
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Eisele, Hermann; Stumpp, Gerhard; Wessel, Wolf; Flaig, Ulrich; and Piwonka, Fridolin, 4,426,980, Cl. 123-478.000.
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Furst, Raymond B., 4,427,338, Cl. 415-210.000.
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Romer, Bendt W., to Danfoss A/S. Motor-driven reciprocating piston compressor, particularly for hermetically encapsulated small refrigerators. 4,427,346, Cl. 417-292.000.

Romes, Roman, to Robert Bosch GmbH. Electrohydraulic control device for use in agricultural machines. 4,427,075, Cl. 172-7.000.

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Rudolph, Rome R., deceased; and by Rudolph, Kathleen, executrix. Overload coupling or clutch. 4,427,399, Cl. 464-38.000.

Rudt, Robert J., to Albany International Corp. Dryer felt fabric and dryer belt. 4,426,795, Cl. 34-116.000.

Ruegsegger, Donald R. Fusible link assembly. 4,427,964, Cl. 337-231.000.

Ruell, Hartwig, to Siemens Corporation. Sensor device for measuring a physical parameter. 4,427,881, Cl. 250-227.000.

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Bruck, Dieter W.; Jeblick, Werner; Konigshofen, Heinrich; Roos, Ernst; and Ruetz, Lother, 4,427,817, Cl. 524-367.000.

Ruf, Max: *See*—
van Basshuysen, Richard; Schmidt, Dietrich; and Ruf, Max, 4,427,150, Cl. 237-2.00A.

Rumpf, Robert J., to Firestone Tire & Rubber Company, The. Cinch lock for safety belt retractors. 4,427,164, Cl. 242-107.40R.

Ruppert, Helmut: *See*—
Eisbrecher, Hans-Dieter; and Ruppert, Helmut, 4,427,398, Cl. 464-26.000.

Rutgerswerke Aktiengesellschaft: *See*—
Stadelhofer, Jurgen; Franck, Heinz-Gerhard; and Kohler, Helmut, 4,427,526, Cl. 208-8.0LE.

Ryobi Ltd.: *See*—
Fujisawa, Nobuhiko; and Matsui, Yoshiki, 4,426,929, Cl. 101-76.000.
Honkawa, Yoshinori, 4,428,041, Cl. 364-183.000.

S & C Electric Company: *See*—
Jarosz, John M.; and Panas, William R., 4,427,963, Cl. 337-6.000.
Lin, Chester H., 4,427,862, Cl. 200-252.000.

S.I.P.S.Y.: *See*—
Torossian, Dieran R.; Aubard, Gilbert G.; Roux, Claude P.; and Grouhel, Agnes G., 4,427,671, Cl. 424-243.000.

Saby, Charles; Jeannin, Serge; and Perrier, Jean-Paul, to Societe Anonyme dite: CERAVER. Metal-capped electrical insulator and method of making same. 4,427,844, Cl. 174-188.000.

Sachs, Frederick; and McGarrigle, Richard G., to Research Foundation of State University of New York, The. Microelectrode fabricting apparatus. 4,427,483, Cl. 156-345.000.

Sackler, Richard S.: *See*—
Bunting, Thomas G.; Centrone, Dominic A.; Sackler, Richard S.; and Halpern, Alfred, 4,427,631, Cl. 422-22.000.

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Saito, Junji: *See*—
Oguri, Yasuo; Awata, Mitsuru; Saito, Junji; Inoue, Soichi; Andio, Tatsuo; and Abe, Mitsunobu, 4,427,611, Cl. 264-86.000.

Saito, Takashi, to Victor Company of Japan, Ltd. Case for a rotary recording medium. 4,428,014, Cl. 360-133.000.

Saito, Toshio. Shut-off nozzle for injection moulding of thermoplastics. 4,427,361, Cl. 425-549.000.

Saitou, Shinichi; and Ida, Masatoshi, to Olympus Optical Company Limited. Superminiature tape recorder. 4,428,009, Cl. 360-65.000.

Sakakibara, Yukio: *See*—
Suzuki, Shosuke; Ito, Teruyoshi; Sakakibara, Yukio; Yamada, Takashi; Kubo, Fumiyoshi; Yoshimura, Kunimasa; Ugajin, Mitsuyuki; Kaji, Kiyokane; and Banno, Mitsuyuki, 4,426,975, Cl. 123-425.000.

Sakamoto, Takashi; Suto, Jinkichi; and Moriuchi, Hisahiro, to Hitachi, Ltd. Precharge for split array ratioless ROM. 4,428,067, Cl. 365-104.000.

Sakano, Yasuaki: *See*—
Yagi, Norio; Chiba, Hisashi; Mitsuda, Yutaka; Sakano, Yasuaki; and Aikawa, Masaki, 4,427,832, Cl. 525-238.000.

Sakata, Hirotsugu: *See*—
Mitani, Akio; Matsui, Koichi; and Sakata, Hirotsugu, 4,426,853, Cl. 62-235.100.

Sakumoto, Akinori, to Daiwa Seiko Inc. Bail arm turning device for fishing spinning reel. 4,427,161, Cl. 242-84.20A.

Sakurai, Masaki: *See*—
Abe, Ryozo; Sakurai, Masaki; Sugiyama, Hiroyuki; Yusa, Yasuhiro; and Yoshihara, Kenji, 4,428,074, Cl. 369-32.000.
Sugiyama, Hiroyuki; Abe, Ryozo; Sakurai, Masaki; and Yoshihara, Kenji, 4,428,003, Cl. 358-342.000.

Sandberg, John R. Hydrokinetic spindle assembly. 4,427,308, Cl. 384-115.000.

Sando Iron Works Co., Ltd.: *See*—
Sando, Yoshikazu; Niwa, Susumu; and Ishidoshiro, Hiroshi, 4,426,746, Cl. 8-149.300.

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Norlander, Lars G.; Brask, Erik T.; and Moren, Rolf R., 4,427,307, Cl. 384-93.000.

Sandy Hill Corporation: *See*—
Keller, Martin B., 4,427,722, Cl. 427-420.000.
Sangamo Weston Limited: *See*—
Skinner, Michael J.; Woollven, Jack; Metcalf, Eric; and Dorey, Howard A., 4,428,061, Cl. 364-728.000.
Sani-Seat, Incorporated: *See*—
Seabrooke, Allan B., 4,426,743, Cl. 4-251.000.
Sano, Kiyoshi, to Matsushita Electric Industrial Co., Ltd. Rotary compressor with noise reducing space adjacent the discharge port. 4,427,351, Cl. 418-63.000.
Sanyo Electric Co., Ltd.: *See*—
Furukawa, Nobuhiro; Inoue, Kenji; and Murakami, Shuzo, 4,427,751, Cl. 429-206.000.
Tsukihashi, Akira, 4,427,931, Cl. 318-317.000.
Sargent Industries, Inc.: *See*—
Smith, Fred T., 4,427,231, Cl. 296-183.000.
Sarin, Vinod K.; and Oberhauser, Peter, to GTE Laboratories, Inc. Mining drill. 4,427,082, Cl. 175-413.000.
Sarma, Kalluri R.: *See*—
Ellis, Ralph J.; Gurtler, Richard W.; and Sarma, Kalluri R., 4,427,638, Cl. 422-250.000.
Sasaki, Michiaki; Yamamoto, Kiyokazu; and Hiratsuka, Ko, to Nissan Motor Company, Limited; and Jidosha Denki Kogyo Kabushiki Kaisha. Fuel supply control system for an internal combustion engine. 4,426,978, Cl. 123-458.000.
Sasaki, Yukio: *See*—
Sugio, Akitoshi; Masu, Masanobu; Okabe, Masao; Sasaki, Yukio; and Ishiyama, Kozo, 4,427,814, Cl. 524-126.000.
Sassak, Frank, to McInerney Spring and Wire Company. Pipe clamp and method of clamping. 4,426,761, Cl. 29-447.000.
Sato, Reisuke; and Ando, Shizuo, to Pioneer Electronic Corporation. Drive mode switching device for magnetic tape recorder/reproducer. 4,428,010, Cl. 360-73.000.
Sato, Ryuichi, to Omron Tateisi Electronics Co. Switch assembly. 4,427,957, Cl. 335-19.000.
Sato, Shiro: *See*—
Nagata, Koji; Sato, Shiro; and Ogiso, Akio, 4,427,034, Cl. 138-145.000.
Satoh, Tsutomu: *See*—
Nagazawa, Kohtaro; Satoh, Tsutomu; Morikubo, Kunio; Tanaka, Fujio; and Okuyama, Masaki, 4,427,760, Cl. 430-287.000.
Sauerteig, Wolfgang: *See*—
Lohmann, Joachim W.; Renner, Gunter; and Sauerteig, Wolfgang, 4,427,763, Cl. 430-504.000.
Saul, Keith: *See*—
Roberts, Michael J.; and Saul, Keith, 4,427,107, Cl. 198-844.000.
Saunders, Carter A.; and Brownlee, Sherwood S. Transparency viewing device. 4,426,798, Cl. 40-361.000.
Saunders, Richard J., to Coherent, Inc. Precision machining apparatus and method utilizing a laser. 4,427,872, Cl. 219-121.0LH.
Sauzay, Bertrand. Ski assembly with carrier. 4,427,217, Cl. 280-814.000.
Savard, Hassel J., Jr., to Golf-Eze. Golf cart and similar vehicles. 4,427,084, Cl. 180-19.00H.
Savino, Joseph. Hideaway tie rack for sliding door closets. 4,427,119, Cl. 211-94.000.
Sawafuji Electric Co., Ltd.: *See*—
Kainuma, Hiroyuki; and Kimura, Tadayoshi, 4,427,906, Cl. 310-27.000.
Schabowski, Albin J.: *See*—
Kielma, Ervin J.; Schabowski, Albin J.; and Currer, John T., 4,427,325, Cl. 409-144.000.
Schabrun, Bruno: *See*—
Fehr, Werner; Ohlin, Claes; and Schabrun, Bruno, 4,427,858, Cl. 200-146.00R.
Schacter, Julius: *See*—
Caldwell, Harlan D.; and Schacter, Julius, 4,427,782, Cl. 436-542.000.
Schaefer, Thomas J., to Graco Inc. Plural component dispensing device. 4,427,153, Cl. 239-117.000.
Schafer, Georg; Schulz, Eberhard; and Schulz, Otto, to Thomas J. Lipton, Inc. Confectionery articles, and apparatus and processes for producing them. 4,427,703, Cl. 426-101.000.
Schaffer, Helmut: *See*—
Hourticolon, Roland; Roth, Gerhard; Frenken, Hans; Schaffer, Helmut; and Koepke, Gunther, 4,426,757, Cl. 29-121.800.
Schepky, Gottfried: *See*—
Brickl, Rolf; Gruber, Peter; Schepky, Gottfried; and Bozler, Gerhard, 4,427,648, Cl. 424-16.000.
Schepper, Manfred, to Leifeld & Lemke Machinenfabrik & Co. GmbH. Barrel cleaning method. 4,427,455, Cl. 134-22.180.
Schiffman, Elliott; and Altman, Leonard C., to Research Corporation. Formyl-methionyl chemotatic peptide antibiotic conjugates useful in treating infections. 4,427,660, Cl. 424-177.000.
Schiffrin, David J.: *See*—
Collins, Gilbert C.; and Schiffrin, David J., 4,427,267, Cl. 350-357.000.
Schilling, Hugh K., to Horton Industries, Inc. Fluid engaged and spring returned fan clutch. 4,427,102, Cl. 192-85.00A.
Schlagel, Carl A.: *See*—
Ayer, Donald E.; and Schiagel, Carl A., 4,427,591, Cl. 260-397.450.
Schlich, William R.: *See*—
Giles, Harold F., Jr.; and Schlich, William R., 4,427,830, Cl. 525-180.000.
Schlumberger Technology Corporation: *See*—
Chandler, Richard N., 4,427,944, Cl. 324-353.000.
Schluntz, Roy A.; and Stemniski, John R., to Charles Stark Draper Laboratory, Inc., The. Molded inertial sensor. 4,426,889, Cl. 74-5.00R.
Schmauder, Roland: *See*—
Lang, Walter; Blaha, Erich; Schmauder, Roland; and Muchel, Franz, 4,427,269, Cl. 350-500.000.
Schmidt, Dietrich: *See*—
van Basshuysen, Richard; Schmidt, Dietrich; and Ruf, Max, 4,427,150, Cl. 237-2.00A.
Schmidt, Robert L.: *See*—
Peacock, Jon R.; and Schmidt, Robert L., 4,427,633, Cl. 422-83.000.
Schnedecker, Guy, to Commissariat a l'Energie Atomique. Method for selectively obturating at least one end of a structural module. 4,426,762, Cl. 29-527.400.
Schneider, Harold J. Pedal driven outboard propeller and steering assembly. 4,427,392, Cl. 440-30.000.
Schoeffler, William N. Folding pole truckbed. 4,427,120, Cl. 212-186.000.
Schofield, John: *See*—
Murray, Robert J.; and Schofield, John, 4,427,956, Cl. 333-194.000.
Scholz, Donald T. Automatic tuning device. 4,426,907, Cl. 84-454.000.
Schone, Helmut: *See*—
Kahlert, Peter; Schone, Helmut; Johne, Hans; Jentzsch, Arndt; Hefftler, Victor; Kuhnert, Werner; Karl, Rainer; Dittmann, Norbert; Fink, Heiner; and Preusger, Karl-Heinz, 4,427,193, Cl. 271-277.000.
Schopper, Bernd: *See*—
Reinartz, Hans D.; and Schopper, Bernd, 4,427,239, Cl. 303-22.00R.
Schouten, Gerard M.: *See*—
Corrigan, James L.; Howett, Deborah L.; and Schouten, Gerard M., 4,427,118, Cl. 211-45.000.
Schreier, Curtis: *See*—
Kaye, Stanton; and Schreier, Curtis, 4,427,290, Cl. 355-40.000.
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Nudel, Ron; Janauer, Gilbert E.; Schrier, Eugene E.; and Figura, Ilona W., 4,427,796, Cl. 521-139.000.
Schrock, Richard R., to Massachusetts Institute of Technology. Catalyst composition to effect metathesis of acetylenes. 4,427,595, Cl. 260-429.00R.
Schroeder, Kenneth; and Griffin, James, to Pattern-Scan, Inc. Plotting method and apparatus. 4,428,056, Cl. 364-518.000.
Schultz, Eddie F.: *See*—
Humphries, Curtis L.; Schultz, Eddie F.; and Winkelman, Alan M., 4,426,879, Cl. 73-60.100.
Schulz, Eberhard: *See*—
Schafer, Georg; Schulz, Eberhard; and Schulz, Otto, 4,427,703, Cl. 426-101.000.
Schulz, Otto: *See*—
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Schulz, Walther: *See*—
Lindorfer, Walter; Schulz, Walther; Wagner, Fritz; and Jahn-Held, Wilhelm, 4,427,528, Cl. 208-11.0LE.
Schuon, Eberhard, to Wandel & Goltermann GmbH & Co. Method of and system for evaluating bit errors in testing a signal path. 4,428,076, Cl. 371-5.000.
Schupp, Eberhard: *See*—
Kempter, Fritz E.; and Schupp, Eberhard, 4,427,514, Cl. 204-181.00C.
Schwab, Pierre P., to B/K Patent Development Company, Inc. Ganged electrical switches for integrated circuit applications. 4,427,851, Cl. 200-16.00D.
Schwarzkopf Development Corporation: *See*—
Kroll, Augustin, 4,427,322, Cl. 407-105.000.
Scientific Systems, Inc.: *See*—
Charney, Andrew R.; Kercher, Paul W.; and Stone, Stanley A., 4,427,029, Cl. 138-30.000.
SCM Corporation: *See*—
Blanchard, Raymond A., Jr., 4,428,020, Cl. 361-90.000.
Scott Paper Company: *See*—
Gray, Lorin S., III; Mattor, John A.; Millard, Ben; and Ward, Franklin J., 4,427,732, Cl. 428-172.000.
SDS Biotech Corporation: *See*—
Gullo, James M., 4,427,683, Cl. 424-263.000.
Seabrooke, Allan B., to Sani-Seat, Incorporated. Toilet seat lifting device. 4,426,743, Cl. 4-251.000.
Seekings, Gerald A. G.: *See*—
Wells, Anthony J.; Smith, William C.; and Seekings, Gerald A. G., 4,426,855, Cl. 66-125.00R.
Seelen-Kruijssen, Josepha M. E.: *See*—
Kooijmans, Petrus G.; Raudenbusch, Werner T.; Van Steenis, Adrianus M. C.; Kunze, Wolfgang; and Seelen-Kruijssen, Josepha M. E., 4,427,805, Cl. 523-417.000.
Seifert, Peter: *See*—
Konig, Klaus; Becker, Gernot; and Seifert, Peter, 4,427,798, Cl. 521-173.000.
Seilly, Alec H.; and Murray, Andrew E., to Lucas Industries Limited. Liquid fuel pumping apparatus. 4,426,983, Cl. 123-506.000.
Seiter, George M.; and Gould, Richard, to Champion International Corporation. Hermetically sealed tray. 4,427,148, Cl. 229-43.000.
Seki, Fumio, to Yoshida Kogyo K. K. Button orienting and placing apparatus. 4,427,146, Cl. 227-119.000.
Seller, Anthony J., to Tildawn Electronics Ltd. Light bulb mounting unit. 4,428,034, Cl. 362-186.000.
Selva, Enrico: *See*—
Cavalleri, Bruno; and Selva, Enrico, 4,427,656, Cl. 424-118.000.

Senno, Harufumi; Wakamiya, Masayuki; and Horita, Yukio, to Matsushita Electric Industrial Co., Ltd. Electric apparatus and its magnetic core of (100)[011] silicon-iron sheet made by rapid quenching method. 4,427,462, Cl. 148-31.550.

Seoka, Yoshio: *See*—
Aoki, Kozo; and Seoka, Yoshio, 4,427,767, Cl. 430-552.000.

Sera, Hidefumi: *See*—
Kitatani, Katuji; Sera, Hidefumi; Arai, Atsuaki; Ogawa, Masasi; Ishigaki, Kunio; and Ogura, Haruo, 4,427,768, Cl. 430-623.000.

Serapharm Michael Stroetmann: *See*—
Stroetmann, Michael, 4,427,650, Cl. 424-46.000.
Stroetmann, Michael, 4,427,651, Cl. 424-46.000.

Serban, Alexander; Watson, Keith G.; and Warner, Richard B., to ICI Australia Limited. Use of 2-phenoxypyrimidines as herbicides. 4,427,437, Cl. 71-92.000.

Sertich, Anthony T. Vibratory dental scaler. 4,427,384, Cl. 433-120.000.

Servais, Albert; Toussaint, Francois; and Rogghe, Hugo, to Glaverbel. Method of modifying the light-reflecting properties of glass. 4,427,488, Cl. 156-663.000.

Setliff, Jerry; Burnham, Gerald; Smith, Michael; and Hoffman, Richard D., to Texas Instruments Incorporated. Electronic chart system. 4,428,057, Cl. 364-521.000.

Setliff, Jerry L.: *See*—
Robinson, Eugene A.; Setliff, Jerry L.; Smith, Michael D.; and Volpi, John P., 4,428,052, Cl. 364-436.000.

Shade, Russell L., Jr.: *See*—
Bell, Frederic C., Sr.; Nicholson, George T.; Shade, Russell L., Jr.; and Skinner, David R., 4,427,058, Cl. 165-160.000.

Shahriary, Iradj; and Mills, Thomas G., to TRW Inc. Process for fabrication of ohmic contacts in compound semiconductor devices. 4,426,765, Cl. 29-571.000.

Shamenko, Stepan P.: *See*—
Toropov, Gennady A.; Shamenko, Stepan P.; Tsvirko, Georgy L.; Olcinichenko, Viktor G.; Khitun, Georgy A.; and Menyailenko, Anatoly I., 4,426,870, Cl. 72-118.000.

Sharp Kabushiki Kaisha: *See*—
Miyazaki, Ryuji, 4,428,049, Cl. 364-405.000.

Shartzer, Ewart E. Plastic lens insertion and removal device. 4,427,226, Cl. 294-1.0CA.

Shaw, Kenneth N., Jr. Apparatus and method for handling used disposable diapers. 4,427,110, Cl. 206-205.000.

Shay, William, Jr., to Reed Rock Bit Company. Drill bit nozzle retention and alignment system. 4,427,221, Cl. 285-305.000.

Sheahan, Robert F., to American District Telegraph Company. Local control apparatus for central station alarm system. 4,427,974, Cl. 340-539.000.

Shell Internationale Research Maatschappij B. V.: *See*—
Mason, Ronald F.; and Wood, Derek A., 4,427,598, Cl. 260-465.00D.

Shell Oil Company: *See*—
Bhula, Dilipkumar N., 4,427,320, Cl. 405-211.000.
Kooijmans, Petrus G.; Raudenbusch, Werner T.; Van Steenis, Adrianus M. C.; Kunze, Wolfgang; and Seelen-Kruijssen, Josepha M. E., 4,427,805, Cl. 523-417.000.
Martin, Michael K., 4,427,834, Cl. 525-280.000.
van Aken, Andreas B.; van Diepen, Petrus B. J.; and Pedley, Jeffrey B., 4,427,507, Cl. 204-151.000.

Shepherd, Charles G., to B. D. Wait Company Limited. Camping stove. 4,426,990, Cl. 126-9.00B.

Sherlock, John A.: *See*—
Bui, Tuan S.; and Sherlock, John A., 4,427,912, Cl. 310-322.000.

Sherwood, Bob E.: *See*—
Benecke, Herman P.; and Sherwood, Bob E., 4,427,694, Cl. 424-282.000.

Sherwood, Mark J.: *See*—
Chen, Shuenn-tzong; Sherwood, Mark J.; and Warchal, Mary E., 4,427,770, Cl. 435-14.000.

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Katsuki, Kazuo; Shibaoka, Kazuo; Ohnishi, Shunji; and Miwa, Takao, 4,427,743, Cl. 428-424.600.

Shichman, Daniel; and Enders, George E., to NRM Corporation. Belt folding machine and method. 4,427,473, Cl. 156-130.000.

Shiiba, Kazuyuki: *See*—
Yamada, Noboru; Iio, Kenji; and Shiiba, Kazuyuki, 4,426,862, Cl. 70-69.000.

Shima, Takao: *See*—
Yamamura, Shigeyuki; Kosemura, Kinjiro; Shima, Takao; and Hidaka, Norio, 4,427,991, Cl. 357-74.000.

Shimada, Shigeru; and Kakumoto, Shigeru, to Hitachi, Ltd. Line recognition method. 4,428,077, Cl. 382-9.000.

Shimadzu Seisakusho Ltd.: *See*—
Takeda, Takehiro, 4,427,885, Cl. 250-296.000.

Shimano Industrial Company Limited: *See*—
Noda, Hideo, 4,427,162, Cl. 242-84.21R.

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Kosa, Yasunobu; and Shimizu, Shinji, 4,426,764, Cl. 29-571.000.

Shimokura, Akihiro; and Imaizumi, Tomio, to Tokico Ltd. Extensible strut for use in device such as a gas spring. 4,427,188, Cl. 267-64.120.

Shinjo, Masayoshi: *See*—
Fukui, Shoshin; Shinjo, Masayoshi; and Aoyama, Hirokazu, 4,427,803, Cl. 523-402.000.

Shroff, Arvind, to Thomson-CSF. Heating element for indirectly heated cathode and method for the manufacture of such an element. 4,427,916, Cl. 313-346.00R.

Shutske, Gregory M., to Hoechst-Roussel Pharmaceuticals Inc. 1,2-Benzisoxazoloxyethylamines and intermediates for the preparation thereof. 4,427,691, Cl. 424-272.000.

Sibilia, John P.: *See*—
Degrassi, Alfieri; Sacks, William; Sibilia, John P.; Kotliar, Abraham M.; and Mason, Charles D., 4,427,825, Cl. 525-56.000.

Sieber, Werner: *See*—
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Siemens Aktiengesellschaft: *See*—
Albert, Cornelia; and Rauterberg, Ulf, 4,427,612, Cl. 264-154.000.
Bahnsen, Heiner; and Hosten, Daniel, 4,427,520, Cl. 204-224.00R.
Birkle, Siegfried; Stoger, Klaus; Gehring, Johann; and de Vries, Hans, 4,427,522, Cl. 204-279.000.
Bruns, Hartmut, 4,427,899, Cl. 307-66.000.
de Vries, Hans; Birkle, Siegfried; Stoeger, Klaus; and Gehring, Johann, 4,427,518, Cl. 204-201.000.
Niethhammer, Dieter; Eggertsberger, Robert; and Wilmers, Gerhard, 4,428,042, Cl. 364-200.000.
Veith, Richard; and Stocker, Helmut, 4,427,954, Cl. 333-153.000.

Siemens-Allis, Inc.: *See*—
Kleinecke, John D.; Farag, Samir F.; and Little, Thomas R., 4,427,854, Cl. 200-50.0AA.

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Ruell, Hartwig, 4,427,881, Cl. 250-227.000.

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Taumann, Leonhard, 4,427,890, Cl. 250-385.000.

Sietmann, Vernon H.; Stockdale, Steven C.; and Stockdale, Elmer G. Heat exchanger furnace. 4,426,937, Cl. 110-288.000.

Sillem, Paul: *See*—
Wolters, Henk R.; and Sillem, Paul, 4,427,078, Cl. 173-126.000.

Simmonds Precision Products Inc.: *See*—
Ketcham, Lyman, 4,427,616, Cl. 264-286.000.

Simonsen, Bent P. Resistor coolant device. 4,427,965, Cl. 338-55.000.

Simonson, Edwin J.: *See*—
Allaire, Roger A.; and Simonson, Edwin J., 4,427,430, Cl. 65-41.000.

Simplicity Manufacturing, Inc.: *See*—
Klas, Kenneth H.; and Ansay, Norbert J., 4,426,831, Cl. 56-295.000.

Singer Company, The: *See*—
Cantada, Edilberto, 4,426,943, Cl. 112-221.000.
Larsen, Robert H.; and Piszczek, Harold R., 4,427,165, Cl. 242-157.000.

Sisson, Albert E.; and Lewis, Donald J., to Bendix Corporation, The. Pressure time controlled unit injector. 4,427,152, Cl. 239-90.000.

Sisson, Albert E.: *See*—
Taplin, Lael B.; Walter, Richard P.; Kelso, Charles R.; and Sisson, Albert E., 4,426,977, Cl. 123-446.000.

Siwek, Erwin G., to General Electric Company. Method for predetermining peel strength at copper/aluminum interface. 4,427,716, Cl. 427-99.000.

Skidmore, Archie F.: *See*—
Frick, Charles E.; Skidmore, Archie F.; and Williams, Isaac E., 4,427,543, Cl. 210-143.000.

Skinner, David P : *See*—
Bell, Frederic C. Sr.; Nicholson, George T.; Shade, Russell L., Jr.; and Skinner, David R., 4,427,058, Cl. 165-160.000.

Skinner, Michael J.; Wooliven, Jack; Metcalf, Eric; and Dorey, Howard A., to Sangamo Weston Limited. Method and apparatus for receiving carrier-borne digital signals intended to operate remotely-operable switching devices. 4,428,061, Cl. 364-728.000.

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Skinner, Neal G., to Halliburton Company. Retrievable bridge plug. 4,427,063, Cl. 166-134.000.

Skornyakov, Jury N.: *See*—
Petrov, Alexei K.; Akimenko, Vladimir B.; Zhuchin, Vladimir N.; Tsipunov, Alexei G.; Smirnova, Elena N.; Skornyakov, Jury N.; and Klimenko, Alexandr F., 4,427,626, Cl. 419-28.000.

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Smith, David C.: *See*—
Fowler, Michael C.; and Smith, David C., 4,426,843, Cl. 60-203.100.

Smith, David W.; and Gagnon, Francis M., to Caci, Inc. - Federal. Clamp for multiple electrical cables. 4,426,754, Cl. 24-17.0AP.

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Charlesworth, David V.; and Smith, Derek F., 4,427,958, Cl. 335-231.000.

Smith, Donald J., to Communications Technology Corporation. Spring loaded shield bond connector. 4,427,248, Cl. 339-14.00R.

Smith, Fred T., to Sargent Industries, Inc. Refuse compaction apparatus. 4,427,231, Cl. 296-183.000.

Smith, Harry: *See*—
Buckle, Derek R.; and Smith, Harry, 4,427,686, Cl. 424-269.000.

Smith, James N.: *See*—
Ritchie, Kim; and Smith, James N., 4,427,992, Cl. 357-78.000.

Smith, Michael: *See*—
Setliff, Jerry; Burnham, Gerald; Smith, Michael; and Hoffman, Richard D., 4,428,057, Cl. 364-521.000.

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Robinson, Eugene A.; Setliff, Jerry L.; Smith, Michael D.; and Volpi, John P., 4,428,052, Cl. 364-436.000.
Smith & Nephew Associated Companies Ltd.: *See*—
Fennimore, Jack; Potter, William D.; and Kiamil, Sinan B., 4,427,003, Cl. 128-90.000.
Smith, Peter C.: *See*—
Gaines, George L., Jr.; Piacente, Patricia A.; Ward, William J., III; Smith, Peter C.; Gallivan, Timothy J.; and Laska, Harry M., 4,427,579, Cl. 252-639.000.
Smith, Philip L.; and Caprio, Joseph R., to Kupler Corporation. Fully insulated electrical clamp connector with inboard insulating tab and slot. 4,427,253, Cl. 339-98.000.
Smith, Ray F.; and Mulik, Edward J., to R & D Chemical Company. Magnetized hot melt adhesive and method of preparing same. 4,427,481, Cl. 156-306.600.
Smith, Robert K.: *See*—
Proud, Joseph M.; Smith, Robert K.; and Fallier, Charles N., Jr., 4,427,920, Cl. 315-248.000.
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Smith, Robert S.: *See*—
Rhoten, Kenneth D., 4,426,919, Cl. 99-289.00T.
Smith, Russell G., to Xomox Corporation. Apparatus for sampling material from a remote location. 4,426,888, Cl. 73-863.830.
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Smith, William C.: *See*—
Wells, Anthony J.; Smith, William C.; and Seekings, Gerald A. G., 4,426,855, Cl. 66-125.00R.
SmithKline Beckman Corporation: *See*—
Gilvarg, Charles; and Kingsbury, William D., 4,427,582, Cl. 260-112.50R.
SMS Schloemann-Siemag Aktiengesellschaft: *See*—
Steinmetz, Alfred; Exner, Klaus; and Welters, Dieter, 4,426,865, Cl. 72-44.000.
Snider, Charles R.: *See*—
Swanson, Alan W.; Snider, Charles R.; and Spooner, Frank H., 4,426,767, Cl. 29-571.000.
Snopko, Paul A.: *See*—
Hofmann, Judson A.; and Snopko, Paul A., 4,427,847, Cl. 179-2.0TV.
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Whaley, Howard A.; Snyder, William C.; Greenfield, John C.; and Coats, John H., 4,427,776, Cl. 435-169.000.
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S.p.A. Valvole Aerosol Research Italiana -V.A.R.I.: *See*—
Dubini, Uberto, 4,427,137, Cl. 222-402.200.
Societe Anonyme dite: CERAVER: *See*—
Saby, Charles; Jeannin, Serge; and Perrier, Jean-Paul, 4,427,844, Cl. 174-188.000.
Societe Anonyme dite Compagnie Industrielle des Telecommunications CIT-Alcatel: *See*—
de Kermadec, Alain; Delanoe, Christian; and Normand, Gerard, 4,427,988, Cl. 346-155.000.
Societe L. Choquenet (S.A.): *See*—
Choquenet, Pierre; and Carle, Jean C., 4,427,546, Cl. 210-351.000.
Societe Nationale d'Etude et de Construction de Moteurs d'Aviation "S.N.E.C.M.A.": *See*—
Gauje, Georges M. C. A., 4,427,720, Cl. 427-237.000.
Societe Nationale Elf Aquitaine (Production): *See*—
Duvet, Claude; and Iato, Michel, 4,427,218, Cl. 285-184.000.
Societe Suisse pour l'Industrie Horlogere Management Services SA: *See*—
Zumsteg, Alphonse, 4,427,952, Cl. 331-176.000.
Sole, Lloyd H., to Electrolocation Limited. Concealed electrical conductor detecting system. 4,427,942, Cl. 324-326.000.
Solex (U.K.) Limited: *See*—
Ross, Gray E. D., 4,427,608, Cl. 261-39.00D.
Somar Manufacturing Co. Ltd.: *See*—
Nagazawa, Kohtaro; Satoh, Tsutomu; Morikubo, Kunio; Tanaka, Fujio; and Okuyama, Masaki, 4,427,760, Cl. 430-287.000.
Sony Corporation: *See*—
Akagiri, Kenzo; Katakura, Masayuki; and Ookouchi, Motomi, 4,427,950, Cl. 330-149.000.
Kubo, Yoshimi, 4,428,005, Cl. 360-10.300.
Nakamura, Takashi, 4,427,927, Cl. 315-383.000.
Ohgawara, Yoshiaki; and Fujii, Hideaki, 4,428,006, Cl. 360-33.000.
Tamura, Eiji, 4,427,996, Cl. 358-228.000.
Tanaka, Masato; and Furukawa, Shunsuke, 4,428,007, Cl. 360-44.000.
Yamamura, Kazumasa; and Ishiguro, Mamoru, 4,428,001, Cl. 358-335.000.
Sorensen, Jens O. Inclined insulated runner multicavity injection molding. 4,427,618, Cl. 264-328.900.
Soteropulos, Gust S.; and Anstey, Henry D., to Deere & Company. Belt for round baler. 4,426,926, Cl. 100-88.000.
Sotoma, Nobuo: *See*—
Ikeyama, Norio; Sotoma, Nobuo; and Tamaru, Shusaku, 4,427,200, Cl. 277-3.000.
Spademan, Richard G. Sport shoe with a dynamic fitting system. 4,426,796, Cl. 36-119.000.
Spaulding, Tedford H.: *See*—
Becher, James V.; and Spaulding, Tedford H., 4,427,879, Cl. 250-215.000.
Spector, George: *See*—
Kiefer, Mercedes; and Spector, George, 4,427,001, Cl. 128-24.400.
Miller, George W.; and Spector, George, 4,427,159, Cl. 242-55.300.
Speer, Spencer J., to General Dynamics. Man-portable foldable launcher rocket weapon system. 4,426,910, Cl. 89-1.816.
Speich, Jorge: *See*—
Grebenstein, Hermann; and Speich, Jorge, 4,427,331, Cl. 414-277.000.
Spencer, Elbert M.: *See*—
Wolniak, Stanley C.; Kincaid, Herbert; Spencer, Elbert M.; and Brown, Ronald L., 4,427,852, Cl. 200-44.000.
Sperry Cororation: *See*—
Swanson, Alan W.; Snider, Charles R.; and Spooner, Frank H., 4,426,767, Cl. 29-571.000.
Sperry Corporation: *See*—
Campbell, Willis R., 4,426,833, Cl. 56-341.000.
Matthews, Hugh B., 4,426,849, Cl. 60-641.400.
Sperry, Elmer A., III, to Beckman Instruments, Inc. Molded conductivity cell body. 4,427,945, Cl. 324-446.000.
Sperry Vickers Lucifer S. A.: *See*—
Livet, Jean, 4,427,176, Cl. 251-68.000.
Spiegel, Herbert E.: *See*—
Newman, Edward; Nishikawa, A. Hirotoshi; Spiegel, Herbert E.; and Symington, Julia, 4,427,783, Cl. 436-542.000.
Spies, Klaus, to Fried. Krupp Gesellschaft mit beschrankter Haftung. Method of and device for controlling and cooling of a continuous rolled member, e.g. a wire. 4,427,463, Cl. 148-129.000.
Spohr, Albert R.: *See*—
Coleman, Donald J.; Jackson, Wilbur C.; Lube, Robert R.; and Spohr, Albert R., 4,426,777, Cl. 30-34.200.
Spooner, Frank H.: *See*—
Swanson, Alan W.; Snider, Charles R.; and Spooner, Frank H., 4,426,767, Cl. 29-571.000.
Sprague Electric Company: *See*—
Nguyen, Trung H.; Randall, John J., Jr.; and McPherson, Allan B., 4,427,506, Cl. 204-129.400.
Ross, Sidney D.; and Dunkl, Franz S., 4,428,028, Cl. 361-433.000.
Sprecker, Mark A.; Klemarczyk, Philip T.; and Belko, Robert P., to International Flavors & Fragrances Inc. Use of cyclohexenyl-alpha-alkyl acrolein derivatives in augmenting or enhancing the aroma or taste of foodstuffs. 4,427,708, Cl. 426-538.000.
Springer, Timothy A., to President and Fellows of Harvard College. Method of making monoclonal antibodies. 4,427,653, Cl. 424-85.000.
Spurrell, Roworth A. J.; Nappholz, Tibor A.; and Swift, Stephen J., to Telectronics Pty. Ltd. Tachycardia control pacer with improved detection of tachycardia termination. 4,427,011, Cl. 128-419.0PG.
Square D Company: *See*—
Hart, Robert E., 4,426,960, Cl. 123-41.490.
Srinivasan, Damodaran: *See*—
Kinsella, John E.; and Srinivasan, Damodaran, 4,427,580, Cl. 260-112.00R.
Srivatsa, Sanjay R.; and Zuerner, Edwin C., Jr. Method and apparatus for recovering oil from waste oil emulsion. 4,426,877, Cl. 73-54.000.
Stach, Leonard J.: *See*—
Wu, Frank; and Stach, Leonard J., 4,427,441, Cl. 71-96.000.
Stachowicz, Robert W., to Dresser Industries, Inc. Turbocharged engine exhaust gas recirculation system. 4,426,848, Cl. 60-605.000.
Stackhouse, Donald F.; and Pham, Ut V., to Westinghouse Electric Corp. High maximum service temperature low cure temperature non-linear electrical grading coatings resistant to V.P.I. resins containing highly reactive components. 4,427,740, Cl. 428-324.000.
Stadelhofer, Jurgen; Franck, Heinz-Gerhard; and Kohler, Helmut, to Rutgerswerke Aktiengesellschaft. Process for the production of hydrogenated aromatic compounds and their use. 4,427,526, Cl. 208-8.0LE.
Stal-Laval Turbin AB: *See*—
Bergkvist, Jorgen, 4,427,364, Cl. 431-170.000.
Stalzer, Henry, to Pitney Bowes Inc. Xerographic electronic printer. 4,427,275, Cl. 354-4.000.
Stamicarbon B.V.: *See*—
Dorrestijn, Antoon; Lemstra, Pieter J.; and Van Unen, Lambert H. T., 4,427,795, Cl. 521-134.000.
Standard Car Truck Company: *See*—
Geyer, Robert P., 4,426,934, Cl. 105-197.0DB.
Standard Oil Company, The: *See*—
Li, George S., 4,427,419, Cl. 55-16.000.
Pedersen, S. Erik; Bremer, Noel J.; and Callahan, James L., 4,427,792, Cl. 502-210.000.
Standard Oil Company (Indiana): *See*—
Fields, Ellis K.; and Anderson, Ronald L., 4,427,565, Cl. 252-56.00D.
Stange, Klaus K., to Xerox Corporation. Direct duplex printing on pre-cut copy sheets. 4,427,285, Cl. 355-3.0FU.
Stanley Works, The: *See*—
Betensky, Ellis I.; and Hildebrandt, William J., 4,427,883, Cl. 250-237.00G.
Stapley, Edward O., to Merck & Co., Inc. Antibiotics-875A and production thereof. 4,427,655, Cl. 424-115.000.
Stares, John: *See*—
Cheney, Peter A.; Stares, John; and Vernon, Alan J., 4,427,704, Cl. 426-104.000.
Stark, Martin H.; Pisani, George V.; and Pauquette, James J., to Arrow Paper Products Co. Novelty device. 4,427,724, Cl. 428-7.000.

Stastny, Joseph F., to Cemen-Tech, Inc. Concrete ingredient metering device. 4,427,297, Cl. 366-19.000.

Stauffer Chemical Company: *See—*
Felix, Raymond A., 4,427,599, Cl. 260-502.50F.
Lee, David L., 4,427,699, Cl. 424-322.000.

Stebbings, Ronald F.: *See—*
Cloutier, Paul A.; Oehme, Delbert R.; and Stebbings, Ronald F., 4,427,943, Cl. 324-326.000.

Steichen, John C.: *See—*
Fahy, Edward J.; and Steichen, John C., 4,427,298, Cl. 366-132.000.

Steiger, Ronald P., to Exxon Production Research Co. Apparatus for preventing differential sticking in wells. 4,427,080, Cl. 175-325.000.

Stein Heurtey Societe Anonyme: *See—*
Denis, Michel, 4,427,187, Cl. 266-274.000.

Steinhofer, Konrad, to Steyr-Daimler-Puch Aktiengesellschaft. Infinitely variable cone disk-wrapping vee belt drive for driving a motorcycle. 4,427,402, Cl. 474-13.000.

Steinmetz, Alfred; Exner, Klaus; and Welters, Dieter, to SMS Schloemann-Siemag Aktiengesellschaft. Apparatus for lubricating tools on metal extrusion presses. 4,426,865, Cl. 72-44.000.

Steinwider, Rupert; and Weitzer, Paul, to Veitscher Magnesitwerke-Actien-Gesellschaft. Taphole apparatus. 4,427,184, Cl. 266-45.000.

Stemniski, John R.: *See—*
Schluntz, Roy A.; and Stemniski, John R., 4,426,889, Cl. 74-5.00R.

Stemp, Geoffrey, to Beecham Group P.L.C. Cycloalkylamino derivatives and their use in the treatment of peptic ulcers and the like. 4,427,685, Cl. 424-267.000.

Stephens, Peter H. Multi-medium three-dimensional drawing tool. 4,426,784, Cl. 33-18.00R.

Stetter, Jorg: *See—*
Kraatz, Udo; Stetter, Jorg; Buchel, Karl H.; Frohberger, Paul-Ernst; and Brandes, Wilhelm, 4,427,672, Cl. 424-245.000.

Stevens, William J. Apparatus for recovering metals from solution. 4,427,505, Cl. 204-109.000.

Stevenson, David, to USV Pharmaceutical Corporation. Synthesis of hormone fragments. 4,427,827, Cl. 525-54.110.

Stevenson, Robert L. Stove construction. 4,426,991, Cl. 126-77.000.

Stewart, Howard A.: *See—*
Copie, Fernand; Esterberg, Warren E.; Fadness, Quentin K.; Stewart, Howard A.; and Ringwelski, Robert J., 4,427,334, Cl. 414-710.000.

Stewart, James F.: *See—*
von der Ostea, Eckhart; Stewart, James F.; and Bennett, John M., 4,427,440, Cl. 71-94.000.

Steyr-Daimler-Puch Aktiengesellschaft: *See—*
Steinhofer, Konrad, 4,427,402, Cl. 474-13.000.

Stillie, Donald G., to AMP Incorporated. Means for mounting membrane switches to cathode ray tubes. 4,427,861, Cl. 200-159.00B.

Stilwell, Leo J. Sectional concrete screed machine. 4,427,358, Cl. 425-432.000.

Stipek, Theodor: *See—*
Lehner, Gerhard; and Stipek, Theodor, 4,426,982, Cl. 123-501.000.

Stites, Francis H.: *See—*
Reif, Robert H.; and Stites, Francis H., 4,427,256, Cl. 339-143.00C.

Stockburger, George J., to ICI Americas Inc. Anionic textile treating compositions. 4,427,557, Cl. 252-8.700.

Stockdale, Elmer G.: *See—*
Sietmann, Vernon H.; Stockdale, Steven C.; and Stockdale, Elmer G., 4,426,937, Cl. 110-288.000.

Stockdale, Steven C.: *See—*
Sietmann, Vernon H.; Stockdale, Steven C.; and Stockdale, Elmer G., 4,426,937, Cl. 110-288.000.

Stocker, Helmut: *See—*
Veith, Richard; and Stocker, Helmut, 4,427,954, Cl. 333-153.000.

Stoeger, Klaus: *See—*
de Vries, Hans; Birkle, Siegfried; Stoeger, Klaus; and Gehring, Johann, 4,427,518, Cl. 204-201.000.

Stoger, Klaus: *See—*
Birkle, Siegfried; Stoger, Klaus; Gehring, Johann; and de Vries, Hans, 4,427,522, Cl. 204-279.000.

Stoka, Roerto; and Pickel, Hajo, to ITT Industries Inc. Device for mounting a guiding bolt of a floating-caliper spot-type disc brake. 4,427,096, Cl. 188-73.340.

Stokes, Kerry E.: *See—*
Hobson, Stephan C.; and Stokes, Kerry E., 4,427,326, Cl. 411-5.000.

Stol, Miroslav; Tolar, Miroslav; Adam, Milan; Cefelin, Pavel; and Kalal, Jaroslav, to Ceskoslovenska akademie ved. Composite polymeric material for biological and medical applications and the method for its preparation. 4,427,808, Cl. 524-24.000.

Stolle Corporation, The: *See—*
Kaminski, Elton G., 4,427,318, Cl. 403-408.000.

Stolz, Hermann, to Mato Maschinen- und Metallwarenfabrik Curt Matthaei GmbH & Co. KG. Apparatus for pressure attaching conveyor belt connectors. 4,427,190, Cl. 269-32.000.

Stone, Herbert L., to Exxon Production Research Co. Water and miscible fluid flooding method having good vertical conformance for recovering oil. 4,427,067, Cl. 166-274.000.

Stone, Stanley A.: *See—*
Charney, Andrew R.; Kercher, Paul W.; and Stone, Stanley A., 4,427,029, Cl. 138-30.000.

Storage Technology Corporation: *See—*
Ariniello, Robert M.; and Bray, Stuart W., 4,426,750, Cl. 15-308.000.

Strathman, Lyle R., to Rockwell International Corporation. Dynamic convergence of random scan multi-beam cathode ray tubes. 4,427,926, Cl. 315-368.000.

Straub, Paul J.: *See—*
Godec, Maksimilijan; Foster, John R.; Straub, Paul J.; and Mahler, Allan K., 4,427,223, Cl. 292-92.000.

Straubel, Max: *See—*
Greiner, Max; Laufer, Helmut; and Straubel, Max, 4,426,981, Cl. 123-488.000.

Stringer, Loren F.: *See—*
Wagener, Paul W.; and Stringer, Loren F., 4,427,933, Cl. 318-711.000.

Stroetmann, Michael, to Serapharm Michael Stroetmann. Enriched plasma derivative for advancement of wound closure and healing. 4,427,650, Cl. 424-46.000.

Stroetmann, Michael, to Serapharm Michael Stroetmann. Enriched plasma derivative for enhancement of wound closure and coverage. 4,427,651, Cl. 424-46.000.

Struver, Werner: *See—*
Lange, Peter M.; and Struver, Werner, 4,427,794, Cl. 521-28.000.

Stuckey, Ronald L., to CTS Corporation. Process for producing a circuit module. 4,426,774, Cl. 29-841.000.

Stucki, Samuel, to BBC Brown, Boveri & Company, Limited. Process for the continuous production of nitric oxide (NO). 4,427,504, Cl. 204-101.000.

Stuhmer, Adolf. Prefabricated gazebo. 4,426,814, Cl. 52-82.000.

Stumpe, Thomas R.: *See—*
Parker, Byron R.; and Stumpe, Thomas R., 4,427,433, Cl. 71-34.000.

Stumpp, Gerhard: *See—*
Eisele, Hermann; Stumpp, Gerhard; Wessel, Wolf; Flaig, Ulrich; and Piwonka, Fridolin, 4,426,980, Cl. 123-478.000.

Styrteknik Olof Nestenius AB: *See—*
Nestenius, Nils O., 4,426,942, Cl. 112-108.000.

Suda, Toyoharu: *See—*
Araki, Kenji; Kurata, Masashi; Yamana, Hideo; Suda, Toyoharu; Tayama, Katuhiko; and Watanabe, Masaji, 4,427,460, Cl. 148-12.00C.

Suddeutsche Kuhlerfabrik Julius Fr. Behr GmbH & Co. KG: *See—*
Witzel, Karlheinz, 4,427,339, Cl. 416-131.000.

Sugawara, Hiroyuki: *See—*
Abe, Nobuo; Sugawara, Hiroyuki; Kurosawa, Yukio; Wada, Akira; and Iwashita, Kiyoji, 4,427,857, Cl. 200-144.00B.

Sugimoto, Masunori, to Nippon Electric Co., Ltd. Voltage current converter circuit. 4,427,903, Cl. 307-355.000.

Sugio, Akitoshi; Masu, Masanobu; Okabe, Masao; Sasaki, Yukio; and Ishiyama, Kozo, to Mitsubishi Gas Chemical Company, Inc. Polyphenylene ether resin composition having improved heat stability. 4,427,814, Cl. 524-126.000.

Sugiyama, Hiroyuki; Abe, Ryozo; Sakurai, Masaki; and Yoshihara, Kenji, to Victor Company of Japan, Ltd. Periodical signal detection circuit in a reproducing apparatus. 4,428,003, Cl. 358-342.000.

Sugiyama, Hiroyuki: *See—*
Abe, Ryozo; Sakurai, Masaki; Sugiyama, Hiroyuki; Yusa, Yasuhiro; and Yoshihara, Kenji, 4,428,074, Cl. 369-32.000.

Sugiyama, Masahiro, to Keeper Co., Ltd. Oil seal assembly with unbonded backup ring. 4,427,206, Cl. 277-153.000.

Sulzer Brothers Limited: *See—*
Hintsch, Otto; and Julich, Werner, 4,427,035, Cl. 139-76.000.
Meier, Werner; and Hunkeler, Robert, 4,427,605, Cl. 261-97.000.

Sulzer-Escher Wyss Limited: *See—*
Lieberherr, Jurg; Rebsamen, Ernst; Trachsel, Felix; and Huser, Ludwig, 4,427,552, Cl. 210-741.000.

Sumida, Norio; Oguchi, Yukio; Fujii, Tetsuya; Emi, Toshihiko; Fujimura, Toshio; Ueda, Arata; and Orito, Kenichi, to Kawasaki Steel Corporation. Method of refining molten metal with stirring by repeated operation of suction and discharge. 4,427,444, Cl. 75-93.00R.

Sumida, Seizo: *See—*
Takemoto, Ichiki; Kamoshita, Katsuzo; Yoshida, Ryo; and Sumida, Seizo, 4,427,596, Cl. 260-453.0RW.

Sumitomo Chemical Company, Limited: *See—*
Nagano, Eiki; Hashimoto, Shunichi; Yoshida, Ryo; Matsumoto, Hiroshi; and Kamoshita, Katsuzo, 4,427,438, Cl. 71-92.000.
Takemoto, Ichiki; Kamoshita, Katsuzo; Yoshida, Ryo; and Sumida, Seizo, 4,427,596, Cl. 260-453.0RW.

Sumitomo Durez Company, Ltd.: *See—*
Nakamura, Masayuki; and Tsuriya, Masaaki, 4,427,800, Cl. 523-145.000.

Sumitomo Heavy Industries, Ltd.: *See—*
Fukuoka, Shigenori; Tsutsui, Sadaharu; and Matsumaru, Toshio, 4,427,359, Cl. 425-525.000.
Koyabu, Yukio, 4,427,370, Cl. 432-5.000.
Koyabu, Yukio, 4,427,373, Cl. 432-14.000.

Sumitomo Light Metal Industries, Ltd.: *See—*
Nagata, Koji; Sato, Shiro; and Ogiso, Akio, 4,427,034, Cl. 138-145.000.

Summers, Geoffrey P.: *See—*
Chen, Yok; Gonzalez, Roberto; and Summers, Geoffrey P., 4,427,570, Cl. 252-301.40R.

Sunaoshi, Mitsugu; Tokoro, Koichi; Natori, Takeshi; and Yuki, Kojiro, to Hitachi Cable, Ltd. Port section structure for mounting replacements on a shielding box. 4,427,894, Cl. 250-515.100.

Sunbeam Corporation: *See—*
Coleman, Donald J.; Jackson, Wilbur C.; Lube, Robert R.; and Spohr, Albert R., 4,426,777, Cl. 30-34.200.

Sunderland, Richard T.: *See—*
Meilenner, Norbert J.; Sunderland, Richard T.; and Cook, John W., 4,426,837, Cl. 57-293.000.

Suni, Jueea I.: *See*—
Adlercreutz, Herman; Suovaniemi, Osmo A.; Partasen, Paul; and Suni, Jueea I., 4,427,769, Cl. 435-7.000.
Sunohara, Masaaki: *See*—
Omiya, Shoji; Sunohara, Masaaki; Nakagawa, Tokihalu; Inagaki, Seiji; Yamawaki, Junnosuke; Nakamura, Nobuyuki; and Yanagisawa, Kaoru, 4,427,353, Cl. 425-151.000.
Sunouchi, Akio: *See*—
Fujino, Masahisa; Sunouchi, Akio; Suzuki, Nobuyuki; and Suzuki, Ryuji, 4,427,282, Cl. 354-271.100.
Suntory Ltd.: *See*—
Toyoshima, Kumao; Hakura, Akira; Nakanishi, Toshihiro; and Yoshizumi, Hajime, 4,427,657, Cl. 424-177.000.
Suovaniemi, Osmo A.: *See*—
Adlercreutz, Herman; Suovaniemi, Osmo A.; Partanen, Paul; and Suni, Jueea I., 4,427,769, Cl. 435-7.000.
Suto, Jinkichi: *See*—
Sakamoto, Takashi; Suto, Jinkichi; and Moriuchi, Hisahiro, 4,428,067, Cl. 365-104.000.
Sutton, David A., to DMA Sytems Corporation. Combined linear motor and side mounted outboard carriage. 4,427,905, Cl. 310-13.000.
Sutton, Richard M., to Sutton and Thayer, part interest to each. Bow string release. 4,426,989, Cl. 124-35.00A.
Sutton and Thayer: *See*—
Sutton, Richard M., 4,426,989, Cl. 124-35.00A.
Sutz, Richard K.; and Grunwald, Louis J., to Wind Baron Corporation. Straight line drive mechanism drivable by wind or other power source. 4,427,342, Cl. 416-170.00R.
Suzuki, Kohji: *See*—
Oda, Yoshio; Morimoto, Takeshi; and Suzuki, Kohji, 4,427,523, Cl. 204-290.00R.
Suzuki, Masato, to Toko, Inc. Chip type high frequency coil device. 4,427,961, Cl. 336-83.000.
Suzuki, Nobuyuki: *See*—
Fujino, Masahisa; Sunouchi, Akio; Suzuki, Nobuyuki; and Suzuki, Ryuji, 4,427,282, Cl. 354-271.100.
Suzuki, Ryuji: *See*—
Fujino, Masahisa; Sunouchi, Akio; Suzuki, Nobuyuki; and Suzuki, Ryuji, 4,427,282, Cl. 354-271.100.
Suzuki, Shigeyoshi: *See*—
Uchida, Koji; Yamada, Jun; Suzuki, Shigeyoshi; and Kuriu, Sadao, 4,427,754, Cl. 430-60.000.
Suzuki, Shosuke; Ito, Teruyoshi; Sakakibara, Yukio; Yamada, Takashi; Kubo, Fumiyoshi; Yoshimura, Kunimasa; Ugajin, Mitsuyuki; Kaji, Kiyokane; and Banno, Mitsuyuki, to Nippondenso Co., Ltd.; and Toyota Jidosha Kogyo Kabushiki Kaisha. Ignition timing control system for internal combustion engines. 4,426,975, Cl. 123-425.000.
Suzuki, Sunao; and Kotani, Genzaburou, to Mitsubishi Denki Kabushiki Kaisha. Phase discriminator circuit. 4,427,947, Cl. 328-133.000.
Suzuki, Takashi; Iizuka, Kiyoshi; Ohtaka, Keiji; and Mizutani, Hidemasa, to Canon Kabushiki Kaisha. Diffusion plate. 4,427,265, Cl. 350-321.000.
Suzuki, Yasuhiko: *See*—
Nishio, Kanemitsu; Takagi, Shunichi; and Suzuki, Yasuhiko, 4,427,915, Cl. 313-141.000.
Svenska Rotor Maskiner Aktiebolag: *See*—
Karlsson, Kurt, 4,427,054, Cl. 165-1.000.
Swain, David M., to Rockwell International Corporation. Method and apparatus for laser-stimulated vacuum deposition and annealing technique. 4,427,723, Cl. 427-53.100.
Swan, George A., to Exxon Research and Engineering Co. Catalytic reforming process. 4,427,533, Cl. 208-65.000.
Swanson, Alan W.; Snider, Charles R.; and Spooner, Frank H., to Sperry Cororation. Selective epitaxial etch planar processing for gallium arsenide semiconductors. 4,426,767, Cl. 29-571.000.
Swartz, Raymond K.; and Woellner, Horst L., to Western Electric Co., Inc. Methods of and apparatus for controlling plastic-to-conductor adhesion of plastic-insulated, tinned conductors. 4,427,469, Cl. 156-50.000.
Sweet, Randall P., to Dow Corning Corporation. Extrudable silicone elastomer compositions. 4,427,801, Cl. 523-212.000.
Swensen, Eugene L., to Donn Incorporated. Floor panel and method of making same. 4,426,824, Cl. 52-794.000.
Swift, Stephen J.: *See*—
Spurrell, Roworth A. J.; Nappholz, Tibor A.; and Swift, Stephen J., 4,427,011, Cl. 128-419.0PG.
Swisher, James. Lock and key system of the plunger type. 4,426,860, Cl. 70-34.000.
Sykora, James H. Deep water hydrostatic head control. 4,427,073, Cl. 166-364.000.
Symington, Julia: *See*—
Newman, Edward; Nishikawa, A. Hirotoshi; Spiegel, Herbert E.; and Symington, Julia, 4,427,783, Cl. 436-542.000.
Szalay, Denes: *See*—
Olasz, Sandor; Szalay, Denes; Kovacs, Jozsef; and Kocsis, Oliver, 4,426,948, Cl. 112-273.000.
Szigeti, Elemer. Pill dispenser incorporated in finger ring. 4,427,130, Cl. 221-4.000.
Tabata, Youichiro; Ueguri, Shigeo; Mizuno, Takaji; and Mizuno, Masanori, to Mitsubishi Denki Kabushiki Kaisha. Pulse arc welding machine. 4,427,874, Cl. 219-130.510.
Tachibana, Noriki; Kobayashi, Morio; and Fujimori, Noboru, to Konishiroku Photo Industry Co., Ltd. Protective coating for silver halide photographic light-sensitive material. 4,427,764, Cl. 430-523.000.
Tackett, DeForrest. Lawn clipping vacuum collector. 4,426,830, Cl. 56-202.000.
Tadanier, John S.; Hallas, Robert; Freiberg, Leslie A.; and Bacino, David J., to Abbott Laboratories. 3-Amino-3-demethoxyfortimicins, pharmaceutical compositions thereof and method of use. 4,427,662, Cl. 424-180.000.
Takagi, Shunichi: *See*—
Mizuno, Hisao; Takagi, Shunichi; Nakahara, Kichio; and Nagae, Hiroyuki, 4,427,914, Cl. 313-130.000.
Nishio, Kanemitsu; Takagi, Shunichi; and Suzuki, Yasuhiko, 4,427,915, Cl. 313-141.000.
Takahashi, Kenzoh: *See*—
Hirama, Yutaka; Takahashi, Kenzoh; and Hori, Sadayuki, 4,427,940, Cl. 324-240.000.
Takahashi, Kokaji: *See*—
Miyahara, Akimitsu; Kanazawa, Toshihiko; Takahashi, Kokaji; Ushikubo, Hiroji; and Kawano, Kuniaki, 4,427,027, Cl. 137-576.000.
Takahashi, Sadao: *See*—
Arashi, Norio; Hishinuma, Yukio; Akimoto, Hidetoshi; Takahashi, Sadao; Nakajima, Fumito; and Gomi, Kenichi, 4,427,642, Cl. 423-244.000.
Takahashi, Toshiaki; and Itoh, Noburu, to Konishiroku Photo Industry Co., Ltd. Method of forming an image with a photographic cuprous halide material. 4,427,762, Cl. 430-436.000.
Takahashi, Toshikatsu, to Fuji Xerox Co., Ltd. Placing stand driving device having flywheel effect in only one direction. 4,427,909, Cl. 310-74.000.
Takamura, Masayuki, to Nippon Gakki Seizo Kabushiki Kaisha. Ti-base material for eyeglass-frames and a method for producing same. 4,427,746, Cl. 428-614.000.
Takara Co., Ltd.: *See*—
Tomita, Tohru, 4,427,387, Cl. 434-88.000.
Takarada, Masaaki: *See*—
Aizawa, Hitoshi; and Takarada, Masaaki, 4,428,054, Cl. 364-472.000.
Takasu, Yoshio: *See*—
Fujimura, Naoto; Tanaka, Takashi; Fujita, Takeshi; Matsumoto, Masakazu; Takebayashi, Norie; Takasu, Yoshio; and Ishikawa, Shozo, 4,427,753, Cl. 430-58.000.
Takasugi, Hisashi: *See*—
Takaya, Takao; Takasugi, Hisashi; Tsuji, Kiyoshi; and Chiba, Toshiyuki, 4,427,674, Cl. 424-246.000.
Takaya, Takao; Takasugi, Hisashi; Murata, Masayoshi; and Yoshioka, Akiteru, 4,427,677, Cl. 424-246.000.
Takauji, Kiyomi, to Kabushiki Kaisha Kawai Gakki Seisakusho. Electronic musical instrument. 4,426,903, Cl. 84-1.220.
Takaya, Takao; Takasugi, Hisashi; Tsuji, Kiyoshi; and Chiba, Toshiyuki, to Fujisawa Pharmaceutical Co., Ltd. Cephem compounds. 4,427,674, Cl. 424-246.000.
Takaya, Takao; Takasugi, Hisashi; Murata, Masayoshi; and Yoshioka, Akiteru, to Fujisawa Pharmaceutical Co., Ltd. Cephem compounds. 4,427,677, Cl. 424-246.000.
Takayama, Yoshihiro: *See*—
Yukawa, Hideaki; Nara, Terukazu; and Takayama, Yoshihiro, 4,427,774, Cl. 435-115.000.
Takebayashi, Norie: *See*—
Fujimura, Naoto; Tanaka, Takashi; Fujita, Takeshi; Matsumoto, Masakazu; Takebayashi, Norie; Takasu, Yoshio; and Ishikawa, Shozo, 4,427,753, Cl. 430-58.000.
Takeda Chemical Industries, Ltd.: *See*—
Aibe, Toshio; Tsutsumi, Yoshio; and Noguchi, Katsuya, 4,427,630, Cl. 422-4.000.
Numata, Mitsuo; Yamaoka, Masayoshi; Nishimura, Tatsuo; and Matsumoto, Norichika, 4,427,586, Cl. 260-239.00A.
Takeda, Takehiro, to Shimadzu Seisakusho Ltd. Double focussing mass spectrometer. 4,427,885, Cl. 250-296.000.
Takemoto, Ichiki; Kamoshita, Katsuzo; Yoshida, Ryo; and Sumida, Seizo, to Sumitomo Chemical Company, Limited. N-[2-(Cyclopropyl) ethoxy] phenylanilide derivatives, and their production and use. 4,427,596, Cl. 260-453.0RW.
Takenaka, Hideo. Track roller device. 4,427,311, Cl. 384-418.000.
Takenoya, Hideaki; Inamori, Mikio; and Makabe, Hachiro, to Janome Sewing Machine Co. Ltd. Stitch control method of electronic sewing machine. 4,426,946, Cl. 112-266.100.
Takesue, Morimasa; Otsuka, Hiroyasu; and Yanagihara, Hiroyuki, to Nittetsu Mining Co., Ltd. Method and apparatus for continuously burning particles in air stream in a vertical furnace. 4,427,372, Cl. 432-14.000.
Taki, Yoichiro: *See*—
Ona, Isao; Ozaki, Masaru; and Taki, Yoichiro, 4,427,815, Cl. 524-315.000.
Tamai, Masayoshi: *See*—
Iyoda, Tetsuo; and Tamai, Masayoshi, 4,427,986, Cl. 346-1.100.
Tamaru, Shusaku: *See*—
Ikeyama, Norio; Sotoma, Nobuo; and Tamaru, Shusaku, 4,427,200, Cl. 277-3.000.
Tambrella, Manuel F.: *See*—
Burkemper, Richard L.; and Tambrella, Manuel F., 4,426,797, Cl. 40-16.400.
Tamura, Eiji, to Sony Corporation. Television cameras. 4,427,996, Cl. 358-228.000.
Tanahashi, Toshio; Ohnaka, Hidemi; and Ohmori, Yasuo, to Toyota Jidosha Kabushiki Kaisha. Engine air/fuel ratio control system injecting bleed air into both fuel systems of double barreled carburetor. 4,426,976, Cl. 123-440.000.

Tanaka, Fujio: *See*—
Nagazawa, Kohtaro; Satoh, Tsutomu; Morikubo, Kunio; Tanaka, Fujio; and Okuyama, Masaki, 4,427,760, Cl. 430-287.000.

Tanaka, Masato; and Furukawa, Shunsuke, to Sony Corporation. Method and apparatus for decoding digital data. 4,428,007, Cl. 360-44.000.

Tanaka, Takashi: *See*—
Fujimura, Naoto; Tanaka, Takashi; Fujita, Takeshi; Matsumoto, Masakazu; Takebayashi, Norie; Takasu, Yoshio; and Ishikawa, Shozo, 4,427,753, Cl. 430-58.000.

Tanaka, Toshiyuki: *See*—
Imazeki, Kazuyoshi; and Tanaka, Toshiyuki, 4,427,904, Cl. 307-463.000.

Tanikawa, Koichi: *See*—
Hasegawa, Akira; and Tanikawa, Koichi, 4,427,458, Cl. 148-6.15R.

Tanouchi, Tadao; Kawamura, Masanori; and Havashi, Masaki, to Ono Pharmaceutical Co., Ltd.; and Kissei Pharmaceutical Co., Ltd. Pyridine alkyl benzoic and thenoic acid compounds and their pharmaceutical compositions. 4,427,682, Cl. 424-263.000.

Taplin, Lael B.; Walter, Richard P.; Kelso, Charles R.; and Sisson, Albert E., to Bendix Corporation, The. Dual solenoid distributor pump system. 4,426,977, Cl. 123-446.000.

Taumann, Leonhard, to Siemens Medical Laboratories, Inc. Dose monitor chamber for electron or X-ray radiation. 4,427,890, Cl. 250-385.000.

Tayama, Katuhiko: *See*—
Araki, Kenji; Kurata, Masashi; Yamana, Hideo; Suda, Toyoharu; Tayama, Katuhiko; and Watanabe, Masaji, 4,427,460, Cl. 148-12.00C.

Taylor, Attalee S.: *See*—
Moore, Jerry L.; and Taylor, Attalee S., 4,427,316, Cl. 403-2.000.

Taylor, Murland L. Reverse flow pop-off air control. 4,427,040, Cl. 141-67.000.

Teague, Lyndon M., to Container Products Corporation. Compressed waste holddown. 4,426,927, Cl. 100-219.000.

TEC, Inc.: *See*—
Wyslotsky, Ihor; and Tischer, Robert E., 4,427,129, Cl. 220-306.000.
Wyslotsky, Ihor; and Hoffmann, Erich, 4,427,705, Cl. 426-106.000.

Teichiku Co., Ltd.: *See*—
Omiya, Shoji; Sunohara, Masaaki; Nakagawa, Tokihalu; Inagaki, Seiji; Yamawaki, Junnosuke; Nakamura, Nobuyuki; and Yanagisawa, Kaoru, 4,427,353, Cl. 425-151.000.

Teijin Chemicals, Ltd.: *See*—
Ohara, Osamu; and Kishimoto, Kazuo, 4,427,829, Cl. 525-67.000.

Tekno AG: *See*—
Baliozian, Mardick, 4,428,030, Cl. 362-18.000.

Telectronics Pty. Ltd.: *See*—
Spurrell, Roworth A. J.; Nappholz, Tibor A.; and Swift, Stephen J., 4,427,011, Cl. 128-419.0PG.

Teletype Corporation: *See*—
Huntoon, Francis E., 4,427,998, Cl. 358-294.000.

Tener, William S. Apparatus and method for treating breast tumors. 4,427,005, Cl. 128-303.90R.

Tennessee Valley Authority: *See*—
Mann, Horace C., Jr.; and McGill, Kenneth E., 4,427,432, Cl. 71-34.000.
Parker, Byron R.; and Stumpe, Thomas R., 4,427,433, Cl. 71-34.000.

Tentler, Lynn A. Tree stand. 4,427,092, Cl. 182-134.000.

Terada, Masaki; Yoshimura, Akihiro; Hohsai, Kohichiro; and Minami, Junichi, to Nissin Shokuhin Kabushiki Kaisha. Method of manufacturing an instant bean curd or tofu, and the toju made by such method. 4,427,710, Cl. 426-634.000.

Teramachi, Hiroshi. Endless linear ball bearing. 4,427,240, Cl. 308-6.00C.

Terbrack, Heinz; and Terbrack, Josef. Panel for a composite surface and a method of assembling same. 4,426,820, Cl. 52-594.000.

Terbrack, Josef: *See*—
Terbrack, Heinz; and Terbrack, Josef, 4,426,820, Cl. 52-594.000.

Terrell Machine Company: *See*—
Niederer, Kurt W., 4,427,422, Cl. 55-96.000.

Texaco Inc.: *See*—
Elliott, Lloyd E., Jr.; and Hudson, John L., 4,427,091, Cl. 181-120.000.
Riedesel, Roland G., Jr.; Nussbaum, Theodore W.; and Warren, Wayne F., 4,427,941, Cl. 324-323.000.
Whittle, Joanne R., 4,427,559, Cl. 252-33.200.

Texas Instruments Incorporated: *See*—
Hayn, John W.; and McDonough, Kevin C., 4,428,047, Cl. 364-200.000.
Orcutt, John W., 4,426,913, Cl. 91-376.00R.
Robinson, Eugene A.; Setliff, Jerry L.; Smith, Michael D.; and Volpi, John P., 4,428,052, Cl. 364-436.000.
Setliff, Jerry; Burnham, Gerald; Smith, Michael; and Hoffman, Richard D., 4,428,057, Cl. 364-521.000.

Thermal Systems Limited: *See*—
Fischer, Victor H., 4,426,847, Cl. 60-514.000.

Thermatool Corp.: *See*—
DuBosque, Clayton, Jr., 4,426,998, Cl. 126-448.000.

Thermocell Development Ltd.: *See*—
Smith, Stuart B., 4,427,797, Cl. 521-166.000.

Thiel, Max: *See*—
Friebe, Walter-Gunar; Winter, Werner; Thiel, Max; Roesch, Androniki; and Wilhelms, Otto-Henning, 4,427,680, Cl. 424-258.000.

Thiokol Corporation: *See*—
Bell, Frank H., 4,426,932, Cl. 102-221.000.

Thomas, Garth L.: *See*—
Johnson, Thomas J.; and Thomas, Garth L., 4,427,056, Cl. 165-42.000.

Thomas, Gary E.: *See*—
Crombeen, Jacobus E.; Visser, Jan; and Thomas, Gary E., 4,427,524, Cl. 204-298.000.

Thomas J. Lipton, Inc.: *See*—
Schafer, Georg; Schulz, Eberhard; and Schulz, Otto, 4,427,703, Cl. 426-101.000.

Thomas, Lowell S.: *See*—
McEwen, Gerald K.; and Thomas, Lowell S., 4,427,813, Cl. 524-119.000.

Thomson-CSF: *See*—
Broussoux, Dominique; Facoetti, Hugues; and Micheron, Francois, 4,427,609, Cl. 264-22.000.
Fourcade, Pierre, 4,428,063, Cl. 364-900.000.
Gauthier, Francis, 4,427,717, Cl. 427-163.000.
Puech, Claude; and Papuchon, Michel, 4,427,260, Cl. 350-96.140.
Shroff, Arvind, 4,427,916, Cl. 313-346.00R.

Thomson-CSP: *See*—
Hareng, Michel; Hehlen, Robert; Le Berre, Serge; Leclerc, Pierre; Marcenac, Philippe; and Perbet, Jean-Noel, 4,427,997, Cl. 358-236.000.

Thomson, John A., to Avery-Hardoll Limited. Liquid storage and measurement system. 4,427,132, Cl. 222-23.000.

Thorne, Stephen J.: *See*—
Backhouse, Alan J.; Thorne, Stephen J.; and Hunt, Patrick A., 4,427,820, Cl. 524-504.000.

Thyssen Industrie Aktiengesellschaft: *See*—
Eisbrecher, Hans-Dieter; and Ruppert, Helmut, 4,427,398, Cl. 464-26.000.

Tiilikka, Antero, to Riihimaen Lasi Oy. Method for the opalization of glass. 4,427,429, Cl. 65-33.000.

Tildawn Electronics Ltd.: *See*—
Seller, Anthony J., 4,428,034, Cl. 362-186.000.

Timken Company, The: *See*—
Jatczak, Chester F., 4,427,241, Cl. 308-207.00R.

Tischer, Robert E.: *See*—
Wyslotsky, Ihor; and Tischer, Robert E., 4,427,129, Cl. 220-306.000.

Tisdale, Patrick R.: *See*—
Metzger, Robert W.; Neathery, William D.; Reyes, Peter A.; Tisdale, Patrick R.; Covington, Cecil E.; and Broekhuizen, Willem, 4,427,340, Cl. 416-141.000.

Toda, Minoru: *See*—
Osaka, Susumu; and Toda, Minoru, 4,427,048, Cl. 160-107.000.

Tojza, Roman A.: *See*—
Hooker, Donald E.; and Tojza, Roman A., 4,427,196, Cl. 273-143.00R.

Tokico Ltd.: *See*—
Shimokura, Akihiro; and Imaizumi, Tomio, 4,427,188, Cl. 267-64.120.

Toko, Inc.: *See*—
Suzuki, Masato, 4,427,961, Cl. 336-83.000.

Tokoro, Koichi: *See*—
Sunaoshi, Mitsugu; Tokoro, Koichi; Natori, Takeshi; and Yuki, Kojiro, 4,427,894, Cl. 250-515.100.

Tokunaga, Kazuyoshi; and Anzai, Masayasu, to Hitachi, Ltd.; and Hitachi Koki Co., Ltd. Method for transferring toner image in electrophotography. 4,427,755, Cl. 430-97.000.

Tokyo Gas Co. Ltd.: *See*—
Kamuro, Takashi; Ohtsuga, Hisao; Kimura, Hiroshi; and Nakamura, Takeshi, 4,427,480, Cl. 156-287.000.

Tokyo Sanyo Electric Co., Ltd.: *See*—
Tsukihashi, Akira, 4,427,931, Cl. 318-317.000.

Tokyo Shibaura Denki Kabushiki Kaisha: *See*—
Kihara, Kazuo; and Ikeda, Masashi, 4,428,066, Cl. 365-96.000.
Matsumoto, Hiroshi; and Ogura, Tomoki, 4,427,287, Cl. 355-14.0SH.
Mitani, Akio; Matsui, Koichi; and Sakata, Hirotsugu, 4,426,853, Cl. 62-235.100.
Oda, Goro, 4,427,289, Cl. 355-15.000.
Ohyama, Satoshi; and Kamata, Isao, 4,428,027, Cl. 361-333.000.
Yamaguchi, Hiroyasu; and Kodera, Yasuhiro, 4,427,949, Cl. 330-51.000.

Tol, John M., to Raytheon Company. Adaptive compass and north stabilization drive system. 4,428,053, Cl. 364-457.000.

Tolar, Miroslav: *See*—
Stol, Miroslav; Tolar, Miroslav; Adam, Milan; Cefelin, Pavel; and Kalal, Jaroslav, 4,427,808, Cl. 524-24.000.

Tomita, Tohru, to Takara Co., Ltd. Drawing toy. 4,427,387, Cl. 434-88.000.

Tomuro, Yasuta, to Mitsubishi Denki Kabushiki Kaisha. Waveform shaping circuit. 4,427,901, Cl. 307-268.000.

Tonne, Peter; Mueller, Elisabeth R.; and Goerth, Helmut, to BASF Aktiengesellschaft. Preparation of 1-alkyl-2-chloro-5-nitrobenzene-4-sulfonic acids. 4,427,600, Cl. 260-505.00E.

Toppen, John D., to Clopay Corporation. Window shade clutch assembly. 4,427,050, Cl. 160-315.000.

Toray Silicone Company, Ltd.: *See*—
Ona, Isao; Ozaki, Masaru; and Taki, Yoichiro, 4,427,815, Cl. 524-315.000.

Toreson, James S.: *See*—
Gilovich, Paul A.; and Toreson, James S., 4,428,011, Cl. 360-102.000.

Torniainen, Matti J., to Carrier Corporation. Apparatus and method for forming fins on a tube surface. 4,426,868, Cl. 72-98.000.
Toro Company, The: *See—*
Foster, Leslie W., 4,426,780, Cl. 30-276.000.
Toropov, Gennady A.; Shamenko, Stepan P.; Tsvirko, Georgy L.; Oleinichenko, Viktor G.; Khitun, Georgy A.; and Menyailenko, Anatoly I., to Dnepropetrovsky Gorny Institut Imeni Artema. Method and tool for making elastic thread having closed helical cavity inside thread profile. 4,426,870, Cl. 72-118.000.
Torossian, Dieran R.; Aubard, Gilbert G.; Roux, Claude P.; and Grouhel, Agnes G., to S.I.P.S.Y. Steroids esterified in position 17 and thioesterified in position 21, a process for preparing them and their use as medicaments. 4,427,671, Cl. 424-243.000.
Tortorello, Anthony J.; and Kinsella, Mary A., to DeSoto, Inc. Primary amine functional polymer compositions and coatings. 4,427,804, Cl. 523-404.000.
Tosco Corporation: *See—*
Barney, John H., 4,427,493, Cl. 202-100.000.
Toussaint, Francois: *See—*
Servais, Albert; Toussaint, Francois; and Rogghe, Hugo, 4,427,488, Cl. 156-663.000.
Tower, Timothy M., to Boart International Limited. Positioning of deflection wedges. 4,427,062, Cl. 166-113.000.
Toyo Jozo Kabushiki Kaisha: *See—*
Misaki, Hideo; Muramatsu, Eiji; Ishikawa, Hidehiko; and Matsuura, Kazuo, 4,427,771, Cl. 435-22.000.
Toyo Kogyo Co., Ltd.: *See—*
Kimura, Toshio; Kataoka, Kunitoshi; Yamaji, Yoshiaki; Iwasaki, Hiromi; and Yamashita, Shinichi, 4,427,869, Cl. 219-93.000.
Toyo Kohan Co., Ltd.: *See—*
Miura, Tsuyoshi; Arakida, Yutaka; Kondo, Yoshikazu; and Ide, Tsuneyuki, 4,427,446, Cl. 75-244.000.
Toyoshima, Kumao; Hakura, Akira; Nakanishi, Toshihiro; and Yoshizumi, Hajime, to Suntory Ltd. Method for treatment of transplanted tumors in mice. 4,427,657, Cl. 424-177.000.
Toyota Jidosha Kabushiki Kaisha: *See—*
Hirose, Hisashi; Arai, Hiroshi; Iiyama, Hiroshi; and Komiya, Hirokazu, 4,426,788, Cl. 33-395.000.
Tanahashi, Toshio; Ohnaka, Hidemi; and Ohmori, Yasuo, 4,426,976, Cl. 123-440.000.
Toyota Jidosha Kogyo Kabushiki Kaisha: *See—*
Kubo, Seitoku; Kuramochi, Koujiro; and Kyushima, Tatsuo, 4,426,891, Cl. 74-740.000.
Kubo, Seitoku; Kuramochi, Koujiro; and Kyushima, Tatsuo, 4,427,098, Cl. 192-3.280.
Nakano, Jiro; Miyagi, Hideo; and Ono, Hironobu, 4,426,973, Cl. 123-418.000.
Suzuki, Shosuke; Ito, Teruyoshi; Sakakibara, Yukio; Yamada, Takashi; Kubo, Fumiyoshi; Yoshimura, Kunimasa; Ugajin, Mitsuyuki; Kaji, Kiyokane; and Banno, Mitsuyuki, 4,426,975, Cl. 123-425.000.
TP Laboratories, Inc.: *See—*
Hall, Arthur B., 4,427,381, Cl. 433-14.000.
Trachsel, Felix: *See—*
Lieberherr, Jurg; Rebsamen, Ernst; Trachsel, Felix; and Huser, Ludwig, 4,427,552, Cl. 210-741.000.
Traeger, Glenn N.: *See—*
Gregory, Michael A.; and Traeger, Glenn N., 4,427,024, Cl. 137-362.000.
Trager, Rosemary. Applique method. 4,427,472, Cl. 156-93.000.
Transue, James A., to Ethicon, Inc. Multiple ligating clip applier with rocking escapement. 4,427,008, Cl. 128-325.000.
Trendall, Paul B.: *See—*
Radvan, Bronislaw; Punton, Vaughan W.; and Trendall, Paul B., 4,427,491, Cl. 162-299.000.
Trenne, Myron U., to General Motors Corporation. Fuel injector. 4,427,151, Cl. 239-87.000.
Trett, John: *See—*
Payne, Reginald K.; and Trett, John, 4,427,095, Cl. 187-29.00R.
Truglio, William J., to Wright Laboratories, Inc. Apparatus for microscopic examination of specimens. 4,427,634, Cl. 422-99.000.
Truninger, Thomas, to Adna Aktiengesellschaft. Cable holder having relatively rotatable parts. 4,427,170, Cl. 248-51.000.
Trutzschler GmbH & Co. KG: *See—*
Oellers, Walter; and Fischer, Friederich, 4,426,753, Cl. 19-83.000.
TRW Inc.: *See—*
Shahriary, Iradj; and Mills, Thomas G., 4,426,765, Cl. 29-571.000.
Trybulski, Eugene J.: *See—*
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Weidler, Allen J.: *See*—
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Weirich, Walter; Rosenberg, Harry; and Becker, Kunibert, to Gewerkschaft Eisenhutte Westfalia. Mineral mining installation. 4,427,321, Cl. 405-294.000.

Weissert, Helmut: *See*—
Hegemann, Karl-Rudolf; and Weissert, Helmut, 4,427,183, Cl. 266-44.000.

Weitzer, Paul: *See*—
Steinwider, Rupert; and Weitzer, Paul, 4,427,184, Cl. 266-45.000.

Welch, Willard M.; and Harbert, Charles A., to Pfizer Inc. Hexahydrotrans- and tetrahydropyridoindole neuroleptic agents. 4,427,679, Cl. 424-250.000.

Wells, Anthony J.; Smith, William C.; and Seekings, Gerald A. G., to Bentley Engineering Co., Ltd., The. Yarn feeder mechanisms. 4,426,855, Cl. 66-125.00R.

Wells, Edward S.; Ford, Spencer K.; Werner, Jack E.; and Lindsay, Erin J., to Minnesota Mining and Manufacturing Company. Integrated cardioplegia delivery system. 4,427,009, Cl. 128-400.000.

Welters, Dieter: *See*—
Steinmetz, Alfred; Exner, Klaus; and Welters, Dieter, 4,426,865, Cl. 72-44.000.

Wentworth, Robert J.: *See*—
Belanger, James A.; Wentworth, Robert J.; Calvin, Douglas J.; and Lapham, James M., 4,427,049, Cl. 160-199.000.

Werner, Jack E.: *See*—
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Werner Lehara, Inc.: *See*—
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Wessel, Wolf: *See*—
Eisele, Hermann; Stumpp, Gerhard; Wessel, Wolf; Flaig, Ulrich; and Piwonka, Fridolin, 4,426,980, Cl. 123-478.000.

Wesselmann, Winfried, to Claas Ohg. Self-propelled harvester for sugar cane. 4,426,826, Cl. 56-13.300.

Wessling, Ritchie A.; and Pickelman, Dale M., to Dow Chemical Company, The. Anionic structured particle latexes. 4,427,819, Cl. 524-458.000.

West, Robert C.: *See*—
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Figone, Frank M., 4,426,755, Cl. 24-28.000.
Gillett, James E.; and Wineman, Arthur L., 4,427,621, Cl. 376-260.000.
Kanade, Takeo; and Asada, Haruhiko, 4,427,880, Cl. 250-222.100.
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Stackhouse, Donald F.; and Pham, Ut V., 4,427,740, Cl. 428-324.000.
Vaerewyck, Eugene G.; and Anderson, Arthur E., 4,428,017, Cl. 361-31.000.
Wagener, Paul W.; and Stringer, Loren F., 4,427,933, Cl. 318-711.000.
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Wilhelm, John J., 4,427,317, Cl. 403-31.000.
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Wevers, Henk, to Queen's University at Kingston. Wheelchair and occupant restraint system. 4,427,210, Cl. 280-289.0WC.
Whaley, Howard A.; Snyder, William C.; Greenfield, John C.; and Coats, John H., to Upjohn Company, The. Composition of matter and process. 4,427,776, Cl. 435-169.000.
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Whelchel, Charles J.: *See*—
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Whirlpool Corporation: *See*—
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White, Lawrence K.; and Popov, Metodi, to RCA Corporation. Planarization technique. 4,427,713, Cl. 427-54.100.
Whiteside, Arliss E.; and Wolber, William G., to Bendix Corporation, The. Method and apparatus for the conversion of digital words to analog signals. 4,427,971, Cl. 340-347.0DA.
Whittle, Joanne R., to Texaco Inc. Method of preparing overbased calcium sulfonates. 4,427,559, Cl. 252-33.200.
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Wilhelm, John J., to Westinghouse Electric Corp. Expandable camlock. 4,427,317, Cl. 403-31.000.
Wilhelms, Otto-Henning: *See*—
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Winter, Karl; Gille, Friedrich; and Lotz, Hans, to Karl Mayer Textilmaschinenfabrik GmbH. Measuring arrangement for determining a process variable of a winding arrangement. 4,426,856, Cl. 66-212.000.
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Yamamoto, Soichi. Vertical frictionally abrasive roll rice polishing machine. 4,426,922, Cl. 99-519.000.
Yamamura, Kazumasa; and Ishiguro, Mamoru, to Sony Corporation. Editing control apparatus for video tape recorders. 4,428,001, Cl. 358-335.000.
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Yamashiro, Osamu; and Hongo, Toyohiko, to Hitachi, Ltd. Low power consumption electronic circuit. 4,428,040, Cl. 363-62.000.
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Yasui, Yoshiharu; Onoue, Keiji; Motobayashi, Kozo; and Yoshizawa, Toshio, to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho. Open-end spinning machine. 4,426,840, Cl. 57-301.000.
York, Theodore H., to Westinghouse Electric Corp. Distribution network communication system with flexible message routes. 4,427,968, Cl. 340-310.00R.
Yoshida, Kazunori; and Arakawa, Hiroshi, to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho. Weft guide device in a jet loom. 4,427,036, Cl. 139-435.000.
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Yoshioka, Akiteru: *See*—
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Yuhara, Akitsuna; Iida, Shinya; Abe, Hideo; Kishimoto, Kiyoharu; and Hazama, Katashi, to Hitachi, Ltd. Surface acoustic wave device and method for manufacturing the same. 4,427,515, Cl. 204-192.00E.
Yukawa, Hideaki; Nara, Terukazu; and Takayama, Yoshihiro, to Mitsubishi Petrochemical Co., Ltd. Process for producing L-threonine. 4,427,774, Cl. 435-115.000.
Yuki, Kojiro: *See*—
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Yunan, Malak E., to Du Pont de Nemours, E. I., and Company. Non-electric blasting assembly. 4,426,933, Cl. 102-275.300.
Yusa, Yasuhiro: *See*—
Abe, Ryozo; Sakurai, Masaki; Sugiyama, Hiroyuki; Yusa, Yasuhiro; and Yoshihara, Kenji, 4,428,074, Cl. 369-32.000.
Zabriskie, Dane W., to BioChem Technology, Inc. Enzymatic preparation of particulate cellulose for tablet making. 4,427,778, Cl. 435-277.000.
Zaidan Hojin Handotai Kenkyu Shinkokai: *See*—
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Zanvettor, Sergio, to Ducati Elettrotecnica S.p.A. Powder composition for preparing self-extinguishing coatings. 4,427,806, Cl. 523-460.000.
Zdybak, Walter T., to Georgia-Pacific Corporation. Anionic bituminous emulsions. 4,427,449, Cl. 106-277.000.
Zebrowski, Tadeusz: *See*—
Mackereth, Thomas C.; and Zebrowski, Tadeusz, 4,427,273, Cl. 352-183.000.
Zeeh, Bernd: *See*—
Rentzea, Costin; Zeeh, Bernd; Ammermann, Eberhard; Hamprecht, Gerhard; and Pommer, Ernst-Heinrich, 4,427,688, Cl. 424-270.000.
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Zimmerman, Daniel; and Lu, Shau-Zou, to Celanese Corporation. Glass reinforced poly(oxymethylene) composition having improved property retention. 4,427,807, Cl. 523-466.000.
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Zomaya, Iskander I.; and Davies, John S., to Beecham Group Limited. Clavulanic acid 9-deoxy-9-thia derivatives their preparation and use. 4,427,689, Cl. 424-272.000.
Zuerner, Edwin C., Jr.: *See*—
Srivatsa, Sanjay R.; and Zuerner, Edwin C., Jr., 4,426,877, Cl. 73-54.000.
Zumsteg, Alphonse, to Societe Suisse pour l'Industrie Horlogere Management Services SA. Oscillator circuit with digital temperature compensation. 4,427,952, Cl. 331-176.000.
Zurbrick, John R.: *See*—
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LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 24TH DAY OF JANUARY, 1984

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Aksamit, Frank J., to Pro Sharp Corporation. Saw chain sharpening fixture. Re. 31,504, Cl. 76-25.00A.

Barclay, Donald J.; and Morgan, William M., to International Business Machines Corporation. Electrodeposition of chromium. Re. 31,508, Cl. 204-43.00R.

Bell Telephone Laboratories, Incorporated: *See*—
Carbrey, Robert L., Re. 31,510, Cl. 370-50.000.

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Frost, Arthur W., III, to Federal Paper Board Company, Inc. Method of treating papermaking white water. Re. 31,507, Cl. 162-190.000.

Gulden, George, Jr.: *See*—
Hood, Walter J.; and Gulden, George, Jr., Re. 31,505, Cl. 242-55.000.

Hitachi, Ltd.: *See*—
Ogiue, Katumi; Kondo, Hiroyuki; Ishikawa, Takashi; Mori, Takaaki; and Nitta, Takahisa, Re. 31,506, Cl. 148-175.000.

Hood, Walter J.; and Gulden, George, Jr., to Kent Corporation. Coil depletion sensor. Re. 31,505, Cl. 242-55.000.

International Business Machines Corporation: *See*—
Barclay, Donald J.; and Morgan, William M., Re. 31,508, Cl. 204-43.00R.

Ishikawa, Takashi: *See*—
Ogiue, Katumi; Kondo, Hiroyuki; Ishikawa, Takashi; Mori, Takaaki; and Nitta, Takahisa, Re. 31,506, Cl. 148-175.000.

Kent Corporation: *See*—
Hood, Walter J.; and Gulden, George, Jr., Re. 31,505, Cl. 242-55.000.

Kondo, Hiroyuki: *See*—
Ogiue, Katumi; Kondo, Hiroyuki; Ishikawa, Takashi; Mori, Takaaki; and Nitta, Takahisa, Re. 31,506, Cl. 148-175.000.

Morgan, William M.: *See*—
Barclay, Donald J.; and Morgan, William M., Re. 31,508, Cl. 204-43.00R.

Mori, Takaaki: *See*—
Ogiue, Katumi; Kondo, Hiroyuki; Ishikawa, Takashi; Mori, Takaaki; and Nitta, Takahisa, Re. 31,506, Cl. 148-175.000.

Neidell, Norman S. Echo location systems. Re. 31,509, Cl. 343-9.00R.

Nitta, Takahisa: *See*—
Ogiue, Katumi; Kondo, Hiroyuki; Ishikawa, Takashi; Mori, Takaaki; and Nitta, Takahisa, Re. 31,506, Cl. 148-175.000.

Ogiue, Katumi; Kondo, Hiroyuki; Ishikawa, Takashi; Mori, Takaaki; and Nitta, Takahisa, to Hitachi, Ltd. Method of manufacturing oxide isolated semiconductor device utilizing selective etching technique. Re. 31,506, Cl. 148-175.000.

Pro Sharp Corporation: *See*—
Aksamit, Frank J., Re. 31,504, Cl. 76-25.00A.

Saito, Makoto, to Tomy Kogyo Co., Inc. Trackway and powered vehicle with changeable covers. Re. 31,503, Cl. 46-216.000.

Tomy Kogyo Co., Inc.: *See*—
Saito, Makoto, Re. 31,503, Cl. 46-216.000.

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TO WHOM

CERTIFICATES WERE ISSUED

Aberg, Gunnar A. K.: *See*—
AF Ekenstam, Bo T.; and Aberg, Gunnar A. K., B1 4,302,465, Cl. 424-267.000.

AF Ekenstam, Bo T.; and Aberg, Gunnar A. K. Therapeutically active, substituted piperidines and pyrrolidines therapeutic compositions thereof and methods of use thereof. B1 4,302,465, 1-24-84, Cl. 424-267.000.

Litteral, Carl J., to Union Carbide Corporation. Disproportionation of chlorosilane. B1 4,113,845, 1-24-84, Cl. 423-342.000.

Shell Oil Company: *See*—
Wood, Derek A., B1 4,118,413, Cl. 260-465.00D.

Union Carbide Corporation: *See*—
Litteral, Carl J., B1 4,113,845, Cl. 423-342.000.

Wood, Derek A., to Shell Oil Company. Preparation of phenoxybenzyl esters. B1 4,118,413, 1-24-84, Cl. 260-465.00D.

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Wilkinson, Kenneth E., 272,388, Cl. D24-31.000.

Acharya, Vasant H.; Manchester, Douglas L.; and Hunt, Gilbert S., to Halcyon, Inc. Data transmission multiplexer control panel. 272,355, 1-24-84, Cl. D14-115.000.

Aeronautical Accessories, Inc.: *See*—
Leibin, Ronald A.; and Crowe, Stephen H., Jr., 272,314, Cl. D8-353.000.

AGFA-Gevaert AG: *See*—
Schlagheck, Norbert; and Rabold, Lutz, 272,360, Cl. D16-34.000.

Allibert S.A.: *See*—
Deconinck, Didier, 272,303, Cl. D6-70.000.

Allied Corporation: *See*—
Hoyt, Earl E., 272,387, Cl. D24-8.000.

American Home Products Corporation: *See*—
Cassini, Oleg L., 272,307, Cl. D7-137.000.

American Standard Inc.: *See*—
Bengtson, Hertha A., 272,382, Cl. D23-51.000.
Bocchini, William R.; and Wilcockson, Brian, 272,381, Cl. D23-48.000.

Anchor Hocking Corporation: *See*—
Mumford, Orris E.; and Hollingsworth, John F., 272,324, Cl. D9-452.000.

Anstalt, Zoldia: *See*—
Bulgari, Marina, 272,327, Cl. D11-75.000.

Ashby, Charles W.: *See*—
Bell, John T.; Ashby, Charles W.; and Hamilton, Alfred, 272,311, Cl. D8-71.000.

Asics Corporation: *See*—
Watanabe, Sigenobu, 272,294, Cl. D2-309.000.

Astoria Fibra-Steel, Inc.: *See*—
Jenkins, Donald, 272,313, Cl. D8-329.000.

Atari, Inc.: *See*—
Cheng, Regan L., 272,342, Cl. D14-11.000.

Ault, Charles M.: *See*—
Gonzales, Roman Y.; Prager, Jay M.; and Ault, Charles M., 272,348, Cl. D14-100.000.

Bainton, Donald J., to Continental Group, Inc., The. Container closure. 272,323, 1-24-84, Cl. D9-438.000.

Bartlett, William, to Coin Acceptors, Inc. Coin entry device. 272,367, 1-24-84, Cl. D20-9.000.

Bauer, Greg A. Motorcycle enclosure. 272,335, 1-24-84, Cl. D12-156.000.

Becker, Werner; Volk, Heinrich; and Kistner, Heinz, to Esselte Pendaflex Corporation. Labelling apparatus. 272,365, 1-24-84, Cl. D18-19.000.

Bell, John T.; Ashby, Charles W.; and Hamilton, Alfred, to Container Corporation of America. Gripper bar. 272,311, 1-24-84, Cl. D8-71.000.

Bengtson, Hertha A., to American Standard Inc. Bidet. 272,382, 1-24-84, Cl. D23-51.000.

Benson, David L. Aircraft console. 272,299, 1-24-84, Cl. D3-40.000.

Bergoltz, Anatolio. Electrical box cover. 272,338, 1-24-84, Cl. D13-35.000.

Black & Decker Inc.: *See*—
Dynie, Ernest R.; Norton, Ian F.; Overbury, Douglas G.; and Overy, Colin, 272,310, Cl. D8-65.000.

Bocchini, William R.; and Wilcockson, Brian, to American Standard Inc. Cassette for a sewerless toilet. 272,381, 1-24-84, Cl. D23-48.000.

Braun, Leonard C., to Illinois Tool Works Inc. Multiple container carrying band or the like. 272,316, 1-24-84, Cl. D9-344.000.

Breyer, Brigitte. Hanging decoration in the form of a miniature football uniform. 272,328, 1-24-84, Cl. D11-184.000.

Breyer-Lindner, Brigitte. Hanging ornament. 272,330, 1-24-84, Cl. D11-133.000.

Bulgari, Marina, to Zoldia Anstalt. Ring. 272,326, 1-24-84, Cl. D11-34.000.

Bulgari, Marina, to Anstalt, Zoldia. Earring face. 272,327, 1-24-84, Cl. D11-75.000.

Busch, Douglas F.: *See*—
Lightle, Robert E.; Lockwood, James R.; Busch, Douglas F.; and Mosholder, Michael B., 272,336, Cl. D12-185.000.

B.V. Verenigde Knuststof Bedrijven: *See*—
Visser, Willem, 272,318, Cl. D9-370.000.

C.V.B.G.: *See*—
Dourthe, Pierre, 272,319, Cl. D9-378.000.

Cachola, Richard H., to Piperides, Michael J., a part interest. Golf stance and swing practice device or the like. 272,379, 1-24-84, Cl. D21-234.000.

Cassini, Oleg L., to American Home Products Corporation. Fork or similar article. 272,307, 1-24-84, Cl. D7-137.000.

Cayton, William D. Billiard ball rack. 272,378, 1-24-84, Cl. D21-232.000.

Cheng, Regan L., to Atari, Inc. Cartridge for video game unit. 272,342, 1-24-84, Cl. D14-11.000.

Chiarella, Philip V., to Gamebridge Inc. Hockey skate. 272,377, 1-24-84, Cl. D21-225.000.

Clemmons, Jack H., Jr., to KCJ Manufacturing Corp. Floral display support. 272,329, 1-24-84, Cl. D11-147.000.

Coin Acceptors, Inc.: *See*—
Bartlett, William, 272,367, Cl. D20-9.000.

Connelly, Jerald L. Combined table and multiple seat unit. 272,302, 1-24-84, Cl. D6-45.000.

Container Corporation of America: *See*—
Bell, John T.; Ashby, Charles W.; and Hamilton, Alfred, 272,311, Cl. D8-71.000.

Continental Group, Inc., The: *See*—
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Cosden Technology, Inc.: *See*—
Fortuna, Vincent E., 272,320, Cl. D9-389.000.

Crowe, Stephen H., Jr.: *See*—
Leibin, Ronald A.; and Crowe, Stephen H., Jr., 272,314, Cl. D8-353.000.

Cunnington, Ian J.; and Rainey, Paul N. Exercise machine. 272,376, 1-24-84, Cl. D21-72.000.

Deconinck, Didier, to Allibert S.A. Outdoor armchair. 272,303, 1-24-84, Cl. D6-70.000.

Dickinson, Richard J., to Sinclair Research Limited. Computer. 272,349, 1-24-84, Cl. D14-100.000.

Dillon, Richard R., to Honeywell Information Systems Inc. Video terminal or similar article. 272,353, 1-24-84, Cl. D14-113.000.

Dourthe, Pierre, to C.V.B.G. Bottle. 272,319, 1-24-84, Cl. D9-378.000.

Dynie, Ernest R.; Norton, Ian F.; Overbury, Douglas G.; and Overy, Colin, to Black & Decker Inc. Chain saw with brake. 272,310, 1-24-84, Cl. D8-65.000.

Dziurman, Leonard A., Jr. Combined air pillow and utility bag. 272,300, 1-24-84, Cl. D3-41.000.

Eldon Industries, Inc.: *See*—
Lawrence, William A., 272,312, Cl. D8-71.000.

Elvo Elektronik AG: *See*—
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Energy Development Associates, Inc.: *See*—
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Ritchie, Jack J., 272,332, Cl. D12-91.000.

Epson Corporation: *See*—
Seki, Haruyuki; and Kuroiwa, Chiaki, 272,352, Cl. D14-111.000.

Ernst Leitz Wetzlar GmbH: *See*—
Hengst, Alfred; Janke, Heinrich; Uellenberg, Hans-Kurt; and Keiner, Heinz, 272,361, Cl. D16-132.000.
Hengst, Alfred; Janke, Heinrich; Uellenberg, Hans-Kurt; and Keiner, Heinz, 272,362, Cl. D16-133.000.

Esselte Pendaflex Corporation: *See*—
Becker, Werner; Volk, Heinrich; and Kistner, Heinz, 272,365, Cl. D18-19.000.

Fontaine, Jacques, to Societe a Responsabilite Limitee Dite: Translabel. Luggage tag or similar article. 272,368, 1-24-84, Cl. D20-27.000.

Fontaine, Jacques, to Societe a Responsabilite Limitee Dite: Translabel. Luggage tag or similar article. 272,369, 1-24-84, Cl. D20-27.000.

Fontaine, Jacques, to Societe a Responsabilite Limitee Dite: Translabel. Luggage tag or similar article. 272,370, 1-24-84, Cl. D20-27.000.

Fontaine, Jacques, to Societe a Responsabilite Limitee Dite: Translabel. Luggage tag or similar article. 272,371, 1-24-84, Cl. D20-28.000.

Fortuna, Vincent E., to Cosden Technology, Inc. Bottle. 272,320, 1-24-84, Cl. D9-389.000.

Fujimoto, Kazumi; and Takeda, Yoko, to Sony Corporation. Packing box. 272,322, 1-24-84, Cl. D9-432.000.

Fuller, Barney R., Sr. Safety pad for use with barbell or similar article. 272,375, 1-24-84, Cl. D21-191.000.

Galaxie Corporation: *See*—
Potterbaum, O. Eugene; Weaver, Jerry; and Stutz, Steven D., 272,333, Cl. D12-156.000.
Potterbaum, O. Eugene; Weaver, Jerry; and Stutz, Steven D., 272,334, Cl. D12-156.000.

Gamebridge Inc.: *See*—
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Gemco Ware Inc.: *See*—
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Genaro, Donald M.; and Tilley, Alvin R., to Teletype Corporation. CRT Display cabinet. 272,354, 1-24-84, Cl. D14-113.000.

Gonzales, Roman Y.; Prager, Jay M.; and Ault, Charles M., to Gould Inc. Case for a keyboard and display unit. 272,348, 1-24-84, Cl. D14-100.000.

Gould Inc.: *See*—
Gonzales, Roman Y.; Prager, Jay M.; and Ault, Charles M., 272,348, Cl. D14-100.000.

Greenberg, Lawrence J.; and Hyman, Gregory E. Electronic teaching aid. 272,366, 1-24-84, Cl. D19-60.000.

GTE Automatic Electric Labs Inc.: *See*—
Kaczkos, John E., 272,346, Cl. D14-66.000.
Kaczkos, John E., 272,347, Cl. D14-66.000.

Halcyon, Inc.: *See*—
Acharya, Vasant H.; Manchester, Douglas L.; and Hunt, Gilbert S., 272,355, Cl. D14-115.000.

Hall, Charles B.; Stevens, Myron T.; and Specht, Paul B., to Outboard Marine Corporation. Mounting bracket assembly for an outboard motor. 272,356, 1-24-84, Cl. D15-4.000.

Hall, Charles B.; Stevens, Myron T.; and Specht, Paul B., to Outboard Marine Corporation; and Outboard Marine Corporation. Combined outboard motor and mounting bracket assembly therefor. 272,357, 1-24-84, Cl. D15-4.000.

Hall, Charles B.; Stevens, Myron T.; and Specht, Paul B., to Outboard Marine Corporation. Combined outboard motor and mounting bracket assembly therefor. 272,358, 1-24-84, Cl. D15-4.000.

Hall, Charles B.; Stevens, Myron T.; and Specht, Paul B., to Outboard Marine Corporation. Mounting bracket assembly for an outboard motor. 272,359, 1-24-84, Cl. D15-4.000.

Hamilton, Alfred: *See*—
Bell, John T.; Ashby, Charles W.; and Hamilton, Alfred, 272,311, Cl. D8-71.000.

Hartson-Kennedy Cabinet Top Co., Inc.: *See*—
Kennedy, William M., 272,306, Cl. D6-192.000.

Hengst, Alfred; Janke, Heinrich; Uellenberg, Hans-Kurt; and Keiner, Heinz, to Ernst Leitz Wetzlar GmbH. Binocular. 272,361, 1-24-84, Cl. D16-132.000.

Hengst, Alfred; Janke, Heinrich; Uellenberg, Hans-Kurt; and Keiner, Heinz, to Ernst Leitz Wetzlar GmbH. Binocular. 272,362, 1-24-84, Cl. D16-133.000.

Hollingsworth, John F.: *See*—
Mumford, Orris E.; and Hollingsworth, John F., 272,324, Cl. D9-452.000.

Honeywell Information Systems Inc.: *See*—
Dillon, Richard R., 272,353, Cl. D14-113.000.

Hoyt, Earl E., to Allied Corporation. Laser. 272,387, 1-24-84, Cl. D24-8.000.

Hunt, Gilbert S.: *See*—
Acharya, Vasant H.; Manchester, Douglas L.; and Hunt, Gilbert S., 272,355, Cl. D14-115.000.

Hybrid Electronics Associates Ltd.: *See*—
Sze, Leung Y., 272,325, Cl. D10-128.000.

Hyman, Gregory E.: *See*—
Greenberg, Lawrence J.; and Hyman, Gregory E., 272,366, Cl. D19-60.000.

Ikeda, Tatsuhiko. Buckle for swimming mask and foot fins. 272,296, 1-24-84, Cl. D2-405.000.

Illinois Tool Works Inc.: *See*—
Braun, Leonard C., 272,316, Cl. D9-344.000.

International Telephone and Telegraph Corporation: *See*—
MacKenzie, William G., 272,344, Cl. D14-53.000.

Ito, Hirotomo: *See*—
Unno, Kazuo; Suzuki, Kengo; Ito, Hirotomo; and Sekiguchi, Takao, 272,350, Cl. D14-101.000.

Itoh, Tatsunosuke, to Tokyo Brush Co., Ltd. Brush. 272,301, 1-24-84, Cl. D4-12.000.

Janke, Heinrich: *See*—
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Hengst, Alfred; Janke, Heinrich; Uellenberg, Hans-Kurt; and Keiner, Heinz, 272,362, Cl. D16-133.000.

Jenkins, Donald, to Astoria Fibra-Steel, Inc. Hinge. 272,313, 1-24-84, Cl. D8-329.000.

Johnson, William H., to Shenandoah Manufacturing Co., Inc. Gas fired poultry brooder with ceramic-type radiant. 272,383, 1-24-84, Cl. D23-80.000.
Kabushiki Kaisha Morita Seisakusho: *See*—
Nakano, Kozo; and Nishikawa, Kazuo, 272,385, Cl. D24-02.000.
Kabushiki Kaisha Suwa Seikosha: *See*—
Seki, Haruyuki; and Kuroiwa, Chiaki, 272,352, Cl. D14-111.000.
Kaczkos, John E., to GTE Automatic Electric Labs Inc. Pushbutton dial for a telephone set or the like. 272,346, 1-24-84, Cl. D14-66.000.
Kaczkos, John E., to GTE Automatic Electric Labs Inc. Pushbutton dial for a telephone set or the like. 272,347, 1-24-84, Cl. D14-66.000.
KCJ Manufacturing Corp.: *See*—
Clemmons, Jack H., Jr., 272,329, Cl. D11-147.000.
Keegan, Robert R. Modular chess set piece. 272,374, 1-24-84, Cl. D21-52.000.
Keiner, Heinz: *See*—
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Hengst, Alfred; Janke, Heinrich; Uellenberg, Hans-Kurt; and Keiner, Heinz, 272,362, Cl. D16-133.000.
Kennedy, William M., to Hartson-Kennedy Cabinet Top Co., Inc. Cabinet top. 272,306, 1-24-84, Cl. D6-192.000.
Kessler, Bayard F., to Novation, Inc. Acoustic coupler. 272,345, 1-24-84, Cl. D14-57.000.
Kistner, Heinz: *See*—
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Korzik, James L., to Paradyne Corporation. Housing for printed circuit boards. 272,340, 1-24-84, Cl. D13-41.000.
Kowal, Lucien M. Chess game board or similar article. 272,373, 1-24-84, Cl. D21-24.000.
Kretz, Edward J., to Owens-Illinois, Inc. Bottle. 272,321, 1-24-84, Cl. D9-389.000.
Kroll, Edward A.; and Perwsek, Allan J., to Technicare Corporation. Rectangular gamma camera head with collimator. 272,386, 1-24-84, Cl. D24-02.000.
Kuroiwa, Chiaki: *See*—
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Kutschmende, Ralph. Sign with channels for moveable character plates. 272,372, 1-24-84, Cl. D20-42.000.
La Telephonie Industrielle et Commerciale: *See*—
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Lancaster Colony Corporation: *See*—
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Lawrence, William A., to Eldon Industries, Inc. Soldering station housing. 272,312, 1-24-84, Cl. D8-71.000.
Leibin, Ronald A.; and Crowe, Stephen H., Jr., to Aeronautical Accessories, Inc. Cover for cyclic support in helicopters or the like. 272,314, 1-24-84, Cl. D8-353.000.
Lewis, Willie. Combined cigarette and lighter holder. 272,295, 1-24-84, Cl. D2-400.000.
Lightle, Robert E.; Lockwood, James R.; Busch, Douglas F.; and Mosholder, Michael B., to Lancaster Colony Corporation. Splash guard for automotive vehicle. 272,336, 1-24-84, Cl. D12-185.000.
Lockwood, James R.: *See*—
Lightle, Robert E.; Lockwood, James R.; Busch, Douglas F.; and Mosholder, Michael B., 272,336, Cl. D12-185.000.
MacKenzie, William G., to International Telephone and Telegraph Corporation. Expansible compact telephone. 272,344, 1-24-84, Cl. D14-53.000.
Manchester, Douglas L.: *See*—
Acharya, Vasant H.; Manchester, Douglas L.; and Hunt, Gilbert S., 272,355, Cl. D14-115.000.
Martinez, Arthur T., to T.A.D. Avanti, Inc. Telephone answering unit. 272,341, 1-24-84, Cl. D14-04.000.
Mason, James L.: *See*—
Palermo, Michael A.; and Mason, James L., 272,304, Cl. D6-167.000.
Matsubara, Hideyuki, to Pioneer Kabushiki Kaisha. Loudspeaker. 272,343, 1-24-84, Cl. D14-34.000.
Matsumuro, Kazushige, to Sailor Pen Co., Ltd., The. Combined decoration stamp and cap. 272,363, 1-24-84, Cl. D18-16.000.
Matsumuro, Kazushige, to Sailor Pen Co., Ltd., The. Combined decoration stamp and cap. 272,364, 1-24-84, Cl. D18-16.000.
Mondak, Arthur J.; and Mondak, William J. Tackle box holder. 272,337, 1-24-84, Cl. D12-317.000.
Mondak, William J.: *See*—
Mondak, Arthur J.; and Mondak, William J., 272,337, Cl. D12-317.000.
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Mosholder, Michael B.: *See*—
Lightle, Robert E.; Lockwood, James R.; Busch, Douglas F.; and Mosholder, Michael B., 272,336, Cl. D12-185.000.
Mumford, Orris E.; and Hollingsworth, John F., to Anchor Hocking Corporation. Closure cap or the like. 272,324, 1-24-84, Cl. D9-452.000.
Nakano, Kozo; and Nishikawa, Kazuo, to Kabushiki Kaisha Morita Seisakusho. X-Ray apparatus for dental whole jaw. 272,385, 1-24-84, Cl. D24-02.000.
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Norton, Ian F.: *See*—
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Kessler, Bayard F., 272,345, Cl. D14-57.000.
Oki Electric Industry Co., Ltd.: *See*—
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Outboard Marine Corporation: *See*—
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Overbury, Douglas G.: *See*—
Dynie, Ernest R.; Norton, Ian F.; Overbury, Douglas G.; and Overy, Colin, 272,310, Cl. D8-65.000.
Overy, Colin: *See*—
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Owens-Illinois, Inc.: *See*—
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Pahlanen, Matti. Flower stand and trellis combination. 272,305, 1-24-84, Cl. D6-183.000.
Palermo, Michael A.; and Mason, James L. Pedestal housing for cable television components. 272,304, 1-24-84, Cl. D6-167.000.
Paradyne Corporation: *See*—
Korzik, James L., 272,340, Cl. D13-41.000.
Parmentier, Christian. Multi-compartmented packaging container for ice cream or the like. 272,317, 1-24-84, Cl. D9-345.000.
Penland, William D.; and Sullivan, Jackie C., to Square D Company. Pendant control station. 272,339, 1-24-84, Cl. D13-38.000.
Perwsek, Allan J.: *See*—
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Pioneer Kabushiki Kaisha: *See*—
Matsubara, Hideyuki, 272,343, Cl. D14-34.000.
Piperides, Michael J.: *See*—
Cachola, Richard H., 272,379, Cl. D21-234.000.
Poon, Tit-Wing. Liquid sprayer. 272,380, 1-24-84, Cl. D23-18.000.
Potterbaum, O. Eugene; Weaver, Jerry; and Stutz, Steven D., to Galaxie Corporation. Hatch-back cover for the bed of a pick-up truck. 272,333, 1-24-84, Cl. D12-156.000.
Potterbaum, O. Eugene; Weaver, Jerry; and Stutz, Steven D., to Galaxie Corporation. Hatch-back cover for the bed of a pick-up truck. 272,334, 1-24-84, Cl. D12-156.000.
Prager, Jay M.: *See*—
Gonzales, Roman Y.; Prager, Jay M.; and Ault, Charles M., 272,348, Cl. D14-100.000.
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Ritchie, Jack J., to Energy Development Associates, Inc. Motor vehicle. 272,332, 1-24-84, Cl. D12-91.000.
Rumens, Kurt W. F. Stove doors and hinges therefor. 272,384, 1-24-84, Cl. D23-128.000.
Ryder, Francis E.: *See*—
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Fontaine, Jacques, 272,369, Cl. D20-27.000.
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Potterbaum, O. Eugene; Weaver, Jerry; and Stutz, Steven D., 272,333, Cl. D12-156.000.
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Sullivan, Jackie C.: *See*—
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ISSUED JANUARY 24, 1984

NOTE.—First number, class; second number, subclass; third number, patent number

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68 R 4,427,171
55. 4,427,172

CLASS 249

39 4,427,173

CLASS 250

203 R 4,427,878
215 4,427,879
222.1 4,427,880
227 4,427,881
231 SE 4,427,882
237 G 4,427,883
283 4,427,884
296 4,427,885
310 4,427,886
328 4,427,887
331 4,427,888
339 4,427,889
385 4,427,890
443.1 4,427,891
458.1 4,427,892
506.1 4,427,893
515.1 4,427,894
551 4,427,895

CLASS 251

16 4,427,174
58 4,427,175
68 4,427,176
230 4,427,177

CLASS 252

8.5 A 4,427,556
8.55 R 4,427,564
8.7 4,427,557
8.8 4,427,558
33.2 4,427,559
42.7 4,427,560
45 4,427,561
51.5 A 4,427,562
52 R 4,427,563
56 D 4,427,565
102 4,427,566
116 4,427,567
180 4,427,568
299.63 4,427,569
301.4 R 4,427,570
364 4,427,571
369 4,427,572
455 Z 4,427,577
639 4,427,579

CLASS 254

1 4,427,178
88 4,427,179
106 4,427,180
108 4,427,181
131 4,427,182

CLASS 260

112 R 4,427,580
112.5 R 4,427,581
4,427,582
123.7 4,427,583
124 R 4,427,584
151 4,427,585
239 A 4,427,586
239.3 T 4,427,587
4,427,588
243.3 4,427,589
245.5 4,427,590
397.45 4,427,591
4,427,592
410.9 R 4,427,593
429 C 4,427,594
429 R 4,427,595
453 RW 4,427,596
465 D 4,427,598
B1 44,118,413
465.4 4,427,597
502.5 F 4,427,599
505 E 4,427,600
509 4,427,601
543 P 4,427,602
969 4,427,603

CLASS 261

23 A 4,427,604
39 D 4,427,608
97 4,427,605
111 4,427,606
112 4,427,607

CLASS 264

22 4,427,609
82 4,427,610
86 4,427,611
154 4,427,612
206 4,427,613
210.1 4,427,614
261 4,427,615
286 4,427,616
296 4,427,617
328.9 4,427,618
333 4,427,619

CLASS 266

44 4,427,183
45 4,427,184
220 4,427,185
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139 4,427,189

CLASS 269

32 4,427,190
43 4,427,191

CLASS 271

11 4,427,192
277 4,427,193

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1 GC 4,427,194
73 J 4,427,195
143 R 4,427,196
153 S 4,427,197
269 4,427,198
371 4,427,199

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24 4,427,201
68 4,427,202
81 R 4,427,203
85 4,427,204
134 4,427,205
153 4,427,206

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43.23 4,427,207
153 R 4,427,208
281 R 4,427,209
289 WC 4,427,210
402 4,427,211
511 4,427,212
711 4,427,213
752 4,427,214
4,427,215
806 4,427,216
814 4,427,217

CLASS 285

184 4,427,218
249 4,427,219
263 4,427,220
305 4,427,221
353 4,427,222

CLASS 290

40 R 4,427,896
44 4,427,897

CLASS 292

92 4,427,223
169.23 4,427,224

CLASS 293

132 4,427,225

CLASS 294

1 CA 4,427,226
50.9 4,427,227
83 R 4,427,228

CLASS 296

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183 4,427,231

CLASS 297

161 4,427,232
391 4,427,233
439 4,427,234

CLASS 299

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13 SM 4,427,237
37 P 4,427,238

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22 R 4,427,239

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66 4,427,899
149 4,427,900
268 4,427,901
270 4,427,902
355 4,427,903
463 4,427,904

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6 C 4,427,240
187.2 4,427,242
207 R 4,427,241

CLASS 310

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27 4,427,906
52 4,427,907
57 4,427,908
74 4,427,909
214 4,427,910
261 4,427,911
322 4,427,912
334 4,427,913

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330 R 4,427,245
4,427,246

CLASS 313

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141 4,427,915
346 R 4,427,916
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711 4,427,933
723 4,427,934

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CLASS 333

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19 4,427,957
231 4,427,958
239 4,427,959
285 4,427,960

CLASS 336

83 4,427,961
192 4,427,962

CLASS 337

6 4,427,963
231 4,427,964

CLASS 338

55 4,427,965
162 4,427,966

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75 M 4,427,250
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143 C 4,427,256
184 R 4,427,257
272 R 4,427,258

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52 D 4,427,967
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347 P 4,427,970
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604 4,427,976
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784 4,427,978
805 4,427,979
825.52 4,427,980

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9 R Re.31,509
12 A 4,427,981
17.2 PC 4,427,982
763 4,427,983
764 4,427,984

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155 4,427,988

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422 4,427,268
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507 4,427,270

CLASS 351

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173 4,427,272

CLASS 352

183 4,427,273

CLASS 353

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173.11 4,427,280
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33 4,428,006
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73 4,428,010
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474 4,428,055
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577 4,428,059
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821 4,428,062
900 4,428,063
4,428,064
4,428,065

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96 4,428,066
104 4,428,067
200 4,428,068
215 4,428,069
222 4,428,070
226 4,428,071

CLASS 366

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132 4,427,298

CLASS 367

69 4,428,072
134 4,428,073

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37 4,427,300
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282 4,427,303

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32 4,428,074
45 4,428,075

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260 4,427,621
4,427,622
263 4,427,623
352 4,427,624

CLASS 381

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CLASS 382

9 4,428,077

CLASS 384

93 4,427,307
115 4,427,308
286 4,427,309
415 4,427,310
418 4,427,311

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208 4,427,313
338.2 4,427,314

CLASS 402

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CLASS 403

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31 4,427,317
408 4,427,318

CLASS 405

196 4,427,319
211 4,427,320
294 4,427,321

CLASS 407

105 4,427,322

CLASS 408

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CLASS 409

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144 4,427,325

CLASS 411

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78 4,427,327
508 4,427,328

CLASS 414

68 4,427,329
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331 4,427,332
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296 4,427,347
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363 4,427,349
379 4,427,350

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28 4,427,626

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504 4,427,628
563 4,427,629

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22 4,427,631
56 4,427,632
83 4,427,633
99 4,427,634
113 4,427,635
186.07 4,427,636
198 4,427,637
250 4,427,638

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10 4,427,640
18 4,427,641
244 4,427,642
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580 4,427,643
582 4,427,644
658.5 4,427,645

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1.1 4,427,646
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16 4,427,648
38 4,427,649
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52 4,427,652
85 4,427,653
95 4,427,654
115 4,427,655
118 4,427,656
177 4,427,657
4,427,658
4,427,659
4,427,660
4,427,661
180 4,427,662
4,427,663
4,427,664
200 4,427,665
4,427,666
210 4,427,667
238 4,427,668
4,427,669
241 4,427,670
243 4,427,671
245 4,427,672
4,427,673
246 4,427,674
4,427,675
4,427,676
4,427,677
4,427,678
250 4,427,679
258 4,427,680
260 4,427,681
263 4,427,682
4,427,683
267 4,427,684
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288 4,427,695
309 4,427,696
311 4,427,697
321 4,427,698
322 4,427,699
324 4,427,700

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151 4,427,353
155 4,427,354
156 4,427,355
333 4,427,357
432 4,427,358
525 4,427,359
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549 4,427,361

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101 4,427,702
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106 4,427,705
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578 4,427,709
634 4,427,710

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13 4,427,712
53.1 4,427,723
54.1 4,427,713
87 4,427,714
96 4,427,715
99 4,427,716
163 4,427,717
175 4,427,718
205 4,427,719
237 4,427,720
376.5 4,427,721
420 4,427,722

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7 4,427,724
36 4,427,725
43 4,427,726
116 4,427,727
117 4,427,728
141 4,427,729
156 4,427,730
159 4,427,731
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195 4,427,356
200 4,427,733
234 4,427,734
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462 4,427,744
524 4,427,745
614 4,427,746

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50 4,427,747
82 4,427,748
111 4,427,749
149 4,427,750
206 4,427,751

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37 4,427,752
58 4,427,753
60 4,427,754
97 4,427,755
121 4,427,756
264 4,427,757
271 4,427,758
273 4,427,759
287 4,427,760
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504 4,427,763
523 4,427,764
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196 4,427,365
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5 4,427,380
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79 4,427,382
120 4,427,384
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19 4,427,386
29 4,427,385
45 4,427,388
88 4,427,387
110 4,427,389
159 4,427,390
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7 4,427,769
14 4,427,770
22 4,427,771
27 4,427,772
110 4,427,773
115 4,427,774
161 4,427,775
169 4,427,776
240 4,427,777
277 4,427,778

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57 4,427,415
505 4,427,780
507 4,427,779
509 4,427,781
542 4,427,782
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CLASS 440

30 4,427,392
67 4,427,393

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CLASS 445

37 4,427,395
47 4,427,396
49 4,427,397

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26 4,427,398
38 4,427,399
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13 4,427,402
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CLASS 493

414 4,427,404
444 4,427,405

CLASS 494

16 4,427,406
70 4,427,407

CLASS 501

44 4,427,784
128 4,427,785

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71 4,427,787
4,427,788
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4,427,790
111 4,427,573
154 4,427,574
177 4,427,578
203 4,427,791
208 4,427,575
210 4,427,792
218 4,427,576

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32 4,427,793
134 4,427,795
139 4,427,796
166 4,427,797
173 4,427,798

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116 4,427,799
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222 4,427,802
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417 4,427,805
460 4,427,806
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96 4,427,811
115 4,427,812
119 4,427,813
126 4,427,814
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442 4,427,818
458 4,427,819
504 4,427,820
555 4,427,821
726 4,427,822
833 4,427,823
858 4,427,824

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53 4,427,826
54.11 4,427,827
56 4,427,825
66 4,427,828
67 4,427,829
180 4,427,830
211 4,427,831
238 4,427,832
240 4,427,833
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	400	272,295		71	272,311		75	272,327		34	272,343			272,359		72	272,376
	405	272,296			272,312		133	272,330		53	272,344	D16—	34	272,360		191	272,375
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	41	272,300	D9—	344	272,316			272,332		100	272,348			272,364	D23—	18	272,380
D4—	12	272,301		345	272,317		156	272,333			272,349		19	272,365		48	272,381
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	192	272,306		432	272,322	D13—	35	272,338			272,354			272,370		02	272,385
D7—	137	272,307		438	272,323		38	272,339		115	272,355		28	272,371			272,386
	400	272,308		452	272,324		41	272,340	D15—	4	272,356		42	272,372		31	272,388
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(First number in listing denotes location according to above key. Refer to patent number in body of the Official Gazette to obtain details as to inventor name, location, etc.)

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